PROPOOR POLICIES FOR WATER ACCESS IN MOZAMBICAN PART OF THE LIMPOPO BASIN: EXAMPLE OF MABALANE DISTRICT

November and December 2012 field visits report

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ABBREVIATION

CARITAS	Local branch of the CARITAS Ngo, an NGO related to catholic church.
CFM	Caminho de Ferro Mozambicano / Mozambican Railway
CIP	Centro de Integridade Publica
CPWL	Challenge Program Water and Food
DNA	Direção Nacional das Aguas / National Directorate of Water
DPOPH	Direcção Provincial de Obras Públicas e Habitação / Provincial Directorate for Public Work and Habitation
DUAT	Direito de uso e aproveitamento da Terra / Land use right
FDD	Fundo de Desenvolvimento Distrital/ District Development Fund
FRELIMO	Frente de Liberação do Mozambique, the political party in power in Mozambique
FUNAE	Fundo de Energia, a public institution operating at Mozambique National level to develop, produce and use of different forms of low cost power.
INAS	Instituto Nacional de Ação Social / National Institute of Social Action
IPCC	Instituições de Participação e Consulta Comunitária
L4	Limpopo Basin Development Challenge Project 4 "Water Gouvernance"
LOLE	Lei dos Orgoes Locais do Estado (Law of local bodies of the State)
LUPA	Associação para o Desenvolvimento Comunitario, NGO mozambicana
LWF	Lutherian World Fondation
NGO	Non Gouvernemental Organisation
OIIL	Orçamento de Investimento de Iniciativa Local / Local Initiative Investment Budget
PEDD	Plano Estrategico de Desenvolvimento Distrital - Strategic Plan of District Development
PESOD	Plano Económico e Social e Orçamento Distrital – Economic and Social Plan and District Budget
PNL	Parque Nacional do Limpopo - Limpopo National Park
PRONASAR	Programa Nacional para Sanitação e Aguas rurais
SDAE	Serviços Distritais de Actividades Económicas – District Service of Economic Activities
SDPI	Serviço Distrital de e Infraestruturas
ZT	Zona Tampão / Buffer zone

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1. INTRODUCTION:

Objectives

This work is part of Work package 1 "*Multi-level governance options for improving access to water and poverty reduction*" of the CPWF-L4 Water Governance in the Limpopo basin" It aims at characterizing and analyzing the pro-poor mechanisms in water management arrangements and how these are translated from the national to local levels, as well as how these are affected by other related resources such as land and markets.

The research focuses on the following questions as stated in the project proposal:

1) How formal and informal institutional arrangements constrain or promote access to water, and influence the success of the various interventions that are being implemented locally?

2) to what extent the institutions are effectively coordinated, and are able to facilitate the participation of various stakeholders including local people, the so called beneficiaries,

3) What are the relationship between the biophysical and socio-economic domains and how these have been taken into account by outside actors?

4) What are the impacts of the interventions on the livelihoods of involved households and communities in the short and long term ?

Governance of natural resources is understood as the norms and rules of interaction between groups of actors involved in natural resource use, and the resulting power relationships between these groups (Meadowcroft 2002, Rist, Chidambaranathan et al. 2006). Tackling water resources governance supposes to study the multi-level interactions in this complex system. A multi-level focus questions the way society mobilizes management levels and arenas and the consequences on the water system. The theory of hierarchies in complex system (Koeslter 1967) applied to ecology (Allen and Starr 1982) and the analysis of emergence have underlined that that processes at macro level cannot be reduced to the aggregation of local level processes. Social studies for their part has underlined that a society's collective modes of action (i.e. transversal, vertical and horizontal) cannot be summed up in its hierarchal structure. Scales are social and political constructs (Adger, Brown et al. 2005), and are constantly evolving (Swyngedouw 1997, Brown et Purcell 2005, Ghose 2007). Hence multi-level governance results from the combination of functional links between hierarchical levels, the mobilization of other types of interaction - network, lobbying, social links, interpersonal relationships - and power mechanisms (e.g.: mechanisms of resistance, cooperation and domination) (Rosenau, 1990; Bakis, 1993; Molle 2009).

Formal (rules, regulation, legislation) and informal (norms and comportments, convention etc) institutions control the way water is being used by society not only through the way they are build and edicted but also through the way they are being operationalized and put into practices in a given system. What is at stake is the analysis of interactions of actors to develop, operationalize and implement public policies and/or (institutional, organization and technical innovation) for water management at the different level.

Tackling the issue of poverty and vulnerability/exposure to drought/flood are two of the main challenges of water management in the semi-arid part of the Limpopo basin. Even if different properties poverty and vulnerability are linked. As defined by Bankroff (2007), vulnerability results

from the lacks of mean to overcome, prepare oneself or get over stresses and perturbations of different types. This capacity to face stresses and perturbations depends on the mechanisms that regulate the access and control of resources (or *entitlements*), as a result of the historical development of the society. These mechanisms are intimately linked to the power games between actors (Langridge, et al. 2006; Sen 1981).

In water systems entitlements are linked in particular to land and infrastructures. They control water tenure, access to water, maintenance organization and legitimacy of the governance process (Blackmore 2008). Ribot and Peluso (2003) define access as a property resulting from the combinations of means, processes and relationships between social, structural, or relational mechanisms such as technology, capital, market, labor, knowledge, authority, social relationships, legislation, habits and institutions (Ribot and Peluso 2003). Adaptation capacity mobilizes mechanisms and process that are able to control and affect the environmental and social conditions, such as the political processes, specifically those regarding the entitlements. In a context of heterogeneity, the capacity of adaptation affects the capacity of adaptation of others or challenges the resilience of the system at other level (Paavola 2008).

Besides the politics of water not only translates into practices and norms but also into discourse and argumentation used to serve particular interest and participates in the structuring of governance areas (Taddei 2005, Molle 2008). The interaction between water and society is thus mediated not only by infrastructure, institutions and practices that regulate the flows of water, its economic value, and mobilization, but also by discourses and perceptions reflecting power relationships, identity issues, symbolic meaning etc. But institutional actors often fail to acknowledge how relationships can constrain the access to and use of resources made available through public intervention and tend to limit the social dimensions of innovation to a mere support measures for technical processes. Besides, the ideal of dialogic democracy that underpins a great deal of policy discourse in natural resource management often underestimates the political basis of negotiations -lobbying, networking, coercion and political pressure and other countervailing power strategies. What is at stake is the collective ability to conceive and implement decisions perceived as fair and legitimate by all so that they can effectively be implemented and their consequences and results are acceptable (van der Zaag and Gupta 2008), taking into account rights and entitlements on one hand and the permanence and evolution of social and cultural values on the other hand. The capacity of adaptation relies ultimately more on individuals and institutions rather than in the hard part of a water system (infrastructures). But institutional capacity is a difficult resource to build.

Our objective is to analyse water governance at district level by studying the different formal *and* informal institutional and policy arrangements around which both public and non-public actors interact and how the difference in poverty and vulnerability interacts with these arrangements. In a public policy perspective we will take into account other aspects and policies that interact with water in order to clarify unexpected interactions between several policy sectors. In a semi arid district this includes food security, infrastructure planning mechanisms as well as relief and disaster management mechanisms. A multi-level perspective is undertaken by looking at district, community and basin level.

Methodology

This report presents the preliminary results of the work in Mozambican part of the Limpopo Basin with a focus on the Mabalane district (ANNEX 2). The institutional framework of land and water management in the basin has been presented in a previous document (Ducrot, 2011).

BOX 1 : MABALANE IN NUMBERS.

Sources PESOD 2012, PEDD 2010, Census 2007, SDAE 2012, data SDPI 2012

A territorial area of 9 580 Km2 for 32 040 inhabitants in 5 400 families: population density of 3,3 hab/km2 allocated in 3 administrative posts: Mabalane-Sede (42 % of population), Combumune (30 %) e Ntlavene (28 %).

The 4th poorest district of the eleven Gaza districts, a province which more or less covers the Limpopo basin area. In Mabalane 72 % of population is below poverty line, varying by administrative post: 55 % in Mabalane-Sede but 80 % in Combumune, 88 % in Ntlavene. Part of the first quartile of the poorest districts in Mozambique

None of its 439 km of roads is tarred;

29 DUATs.

In 2010, area cultivated 54 527 ha involving 5 300 families. 39% of this surface is on the river margin and subjected to flood (PEDD 2010). 43 055 ha cultivated in 2011/12 according to SDAE, 2012.

82 moto-pumps (6 nonoperational) and 25 collective irrigated schemes (SDAE, 2012)

33 300 animals (not including poultry) with 65 % cattle heads, and 25 % goats: 39 % of all cattle are in Ntlavene et 50 % of all goats are found in Combumune (PEDD 2010). Estimation by SDAE are much higher: cattle around 33 400 heads (8 % belonging to commercial farms), goats 43 100, poultry 48200 heads.

Forests exploration: Charcoal: 120 304 stere (+ 85 % of increase compared to 2011), Fuelwood: 1 840 stere (+ 113 %).

8 natural resources management committees;

18 communities are located in the buffer zone of Limpopo National Park (approximately 30 % of the population of the district and 49 % of the total population in the buffer zone)

HIV Prevalence: 28,7 %;

District budget in 2007: 12.557.981,14 MT

15 NGOs operating in the district in 2012 among which 1 for agriculture and community development, 1 multi-purpose organization including agriculture, 1 for support to the legalization of communities associations. Other NGOs are involved in education, children nutrition and food security and health;

Water:

- 56 boreholes (69 % operational) and 15 small water systems (53 % operational) excluding 2012 new investments (SDPI, 2012).
- 2012 new investments: 30 boreholes and 7 borehole rehabilitated
- 17 small reservoirs

The work was planned in 3 phases

1. Characterization of water related issues and policies at provincial, district and village levels and implementation of related policies through semi-directed interviews with district and village actors.

2. In a selection of villages, characterization of the relationships between water access, poverty and resilience as well as analysis of perceptions concerning interesting options for water access and adaptation to water related events through individual interviews.

3. Development of participatory simulation tools to share perspective concerning water access and planning at district and village level

This report present the first part of our analysis (part 1) with two field visits amounting to 16 field days undertaken between the 19th of November and 15th of December 2012. The last phase of interviews dedicated to provincial level that was planned in January 2013 has been delayed because of the flood situation in the Gaza province (notably the district of Chokwe and Xai-Xai where many of the provincial services are located).

As mentioned the objective of this field assessment was twofolds:

- **An identification of the policies, program or intervention** related to water access and/or poverty alleviation or food security that were being implemented in the district as well as **the main actors involved as well as their relationships**. This was done by (1) semi directed interviews with technicians (government level, district services and NGOs) (2) consultation of local documents such as district planning and annual balance report, minutes of Consultative Council (3) A census of contentious or cooperative events related to water following loosely the methodology proposed by Funder (2010) was undertaken

- **A characterization of the situation in terms of water access and water issues at district level** in order to provide a typology of situations in which to base a selection of village/community to proceed for deeper analysis. This was done by visiting different villages in the 3 administrative posts of the district (at least 3 villages in different geographical situation in each post). At village level, after interviews of village leadership, boreholes, irrigated scheme and small reservoirs uses and access were characterized by interviews and discussion on site with management committees and users. All boreholes, water points and irrigated scheme of a given village were visited. At village level interviews focused on the history of the village and villagers, the role and responsibility of the different authorities, the relationships with the government structures and actors, the identification of external interventions in the village related to water, food security or poverty alleviation, the social management of water sources and/or irrigated area, land allocation mechanisms, and the implementation of Pronasar in the village. Also we had the opportunity to discuss with users on their own or with group of women. At this stage most of the interviewees were local authorities and members of association;

The field visit program is being presented in Annex 1. and the analysis builds on interviews and discussion with different types of actors notably district administrator, water services and agricultural services representatives, people in charge of district planning, chiefs of administrative post, participants to consultative councils, local leaders in 11 villages, representatives of boreholes committee, boreholes users, workers of water consultation firms, villagers, individual irrigators, members of irrigators associations (ii) participation in meeting related to water at village and district

level (iii) consultation of district documents (planning, annual report , minutes of consultative councils, program report (iv) project document.

2. Water actors, resources and uses

Water access and availability

Apart from domestic purposes (drinking, cooking, washing), livelihoods requires water for watering animals (cattle, goat and sheep, chicken and ducks, pigs), irrigation (which can be done manually or with moto-pumps), beer making[1] and house building[2]. Livelihoods also rely on fishing in the river. Indeed not all households undertakes the same set of activities: the combination and relative importance of activities depends on opportunities (e.g localization of the household in the territory), availability of external income (from migration to South Africa mostly), the relative wealth of the family which in the area is often related to available labor in the household, and connection to traditional owner of the land in the village (see ANNEX 3 for a description of livelihoods) (Fewnet, 2011).

Various village situations in term of water resources

Traditionally residents of the Mabalane district resorted to the Limpopo river water resources, wells and small reservoirs (locally call "*charcos"*) which are natural depressions which fill up during rainy season.

Case study 1: Muandzo. (Rural Village left margin)

Water resources:

- 1 borehole, salted. The borehole is functioning and correctly maintained.
- 1,5 km of the river through a lane

Drinking water comes exclusively from the river, either running water during the rainy season (with problem of turbidity in the flooding month) or through sand-holes when the rivers dries. Water is carried either on the head or tracted by animals

For washing women use either the water from the salted water of the borehole (notably for washing dishes) or the remains of surface water (by coming and bringing the dress to the river).

Cattle use *charcos* of the grazing forested area away from the village where they are left on their own, during rainy season or in the river. In the dry season they come back to the village area and drink in the river either in the pool or in sand holes. Small animals also drink from the rivers.

Bricks making use the water of the river and is done close to the river.

In the colonial time some artificial depressions were extended and small reservoirs were built either to water the herds raised by the Portuguese farmers or to provide water to the population in the plateau areas. The colonial government also developed **small domestic water systems** for both the village of Mabalane-ede and Combumune-Estação, two railways stations on the railway line from Maputo to Zimbabwe (see photos annex5). These water systems pumped water from the Limpopo and delivered tap water to the Portuguese houses (and swimming pools!) and railways tanks. In Combumune-Estação remaining infrastructure shows that the water system also provided water for animal watering (see photos annex5). Mabalane-Sede also hosted one of the main penitentiaries of the colonial regime. A small

[1] Traditional alcoholic drinks play an important role in Changana traditional ceremonies

[2] In these very dry areas, walls are made of stones piled up between two ranges of wood. Spaces between stones are filled with mud whenever possible but where water access is particularly restricted, the walls are not covered and the stones remain visible.

reservoir managed by the penitentiary was used to produce rice through gravitation system.

"*Villagization*" and the civil war have modified the demographic situation of the district. Families who used to be spread in the territory were gathered into village[3] in 1977/1978 by the post-independence government. During the war, population of isolated villagers moved to safer places: some moved to the main villages of the right margin of the river that were guarded by soldiers and created strong links with theses villages, others to refugees' camps across the Kruger Park in South Africa, and some hid in remote forested area that became permanent settlement after the war. Settlement infrastructures, notably water infrastructure were heavily damaged during the war, many of them purposely destroyed. Population lost all their assets including all their cattle which is their main saving mode. In the 90 decade, populations returned to their original settlement at different speed while NGOs intervened to (re)build boreholes and develop small economic activities to facilitate the return of refugees. In the process, a few settlements were created in area where water was being found. In the village close to river, the 2000 floods washed away most of agricultural equipment (moto-pump, plough) and some of the cattle and oxen that the wealthier families had started to accumulate. There were a renewed attention of NGOs which supported development of boreholes, small (manual) irrigation and work for food activities. After a couple of year, these relief orientated activities evolved toward development operations with less donation and contribution of the population both in kind and money.

Case study 1: Madlatimbuti, (Rural village interior, 25 km from the Limpopo river)

Water resources:

- 1 well slightly salted.
- 1 borehole with better water than the well but very low yield – has not been operational for a year.
- Reservoir A: originally build by a Portuguese farmer to water animals and extended in 2007 through Work For Food scheme (INAS); 500 m of the village.
- Two other reservoirs (B and C) located approximately 5 km to the village which are actually two depressions of a non-permanent river bed, shared with others villages.

During the rainy season villagers uses reservoir A (which is fenced against animals and where animals watering is prohibited). When the water tends to diminish they revert to the well. Because it is saline, water of the well can be mixed with reservoir A water (turbid) to make it drinkable. Due to the very low yield of the borehole they only makes use of it (and organize themselves for concerting it) when water availability in the well decrease significantly and when the quality of the water (turbidity) of the reservoirs reaches alarming situation (picture). In very dry year water can be taken from reservoir C (drinking water of another village), and in the Limpopo river either on foot or by cycling.

The use of reservoir B and C have been respectively allocated to animals use and people use since colonial times and are shared between villages. Nine only of 35 families actually own animals. When the quality of the reservoir C is very low enforcement of the rules is not complete but normally the rule is well respected. If the reservoirs dry (as in 2010) animals are brought to the river to drink every two days (near Kokwe the closest village, where the villagers took refuge during the war)

The small systems have long been non-functioning and now the population is relying on the **traditional water sources as well as well as boreholes**. Fifteen small water systems has also been installed powered by diesel pump and more recently by solar panels (FUNAE fundings). Some reservoirs of the plateau are still functioning but the penitentiary irrigation system was destroyed (pictures).

[3] In the process, the new settlements received a name sometimes different to the traditional names of the community, which occasionally are still being in use which can be confusing.

Traditional water sources thus include the depressions or small reservoirs that survived from the colonial time (see picture). Officially the district counts 17 depressions[4] or reservoirs whose water is being used by villages but none of these are permanent except for Pfukwe lake in the southern of the district[5]. These 17 depressions have not been properly mapped yet (see photos annex5). *Charcos* waters are usually only used by animals, and occasionally fishing (providing specific rules of uses[6]). Most of these "*charcos*" are located in the common grazing areas away from villages used during the April to August period and cattle, which are not guarded at this time freely access to them. Only when there is no other water source (neither borehole nor close to the Limpopo River) are they used for domestic purpose (including washing and bathing). In that case access to animal is generally controlled but rules are not always strictly enforced especially at the end of the dry period when water is little available in the plateau area.

There is no permanent rivers in the district, and between October and middle December, the Limpopo River is itself a series of disconnected pools (see photos annex5). Only at the very south of the district (Pfukwe area) after the meeting with the Elephants River controlled by the Massingir Dam (Pictures) it does flow permanently. So the left bank is accessible by 4X4 between the end of July and beginning of October and by boat only, or through the Massingir road and Limpopo

Case study 3: Tsocate, (big village in southern part of the district right margin)

Water resources:

- 3 "old" boreholes with saline water; 1 of them with very saline water present poor yield and technical problems.
- 1 newly (2012) built borehole with good quality water (B4)
- 1 km to the river
- Approximately 5 km do the Pfukwe Lake (fenced) and 2 km to a non-permanent reservoir.

Families have to register in one borehole and pay their monthly contribution to the borehole committee they are being registered to. Some families prefer to use water of the river or reservoir to get non saline water preferred for drinking and domestic purpose or to avoid paying the water fee. Because the water of B4 is much better than the other boreholes non registered people have started to fetch drinking water in B4. Regular B4 users have asked two different files to be created one for regular users and other for non-registered ones which created tensions in the village. The local council however compromised for one file with only two containers allowed by person in the line. The Locality Chief also proposed that B4 payment would be made by container so that everyone could come and fetch water but the proposal was not accepted. He is now looking for external support to equip this borehole as a small water system (moto-pump, solar panel) to increase the total water yield and benefit to the community.

The non-permanent reservoir is devoted to animal drinking and traditional (collective tradition oriented) fishing.

[4] 196 "reservoirs" were identified by remote sensing in 2011 (Waternet, 2012) but they have not been precisely mapped (relative position to the main riverbeds and villages) nor verified on the ground.
[5] It is also in this village that the confluence between the (permanent) Elephant River and Limpopo waters can be found.
[6] It includes in at least one of them a collective fishing event preceded by a traditional ceremony.

Park[7] (which supposes a detour of 250 km) from January to July. Heavy rains and peak flow can make the boat crossing very dangerous.

Between January and July water can be taken directly from the river but during the dry season superficial holes are being dug in the sandy river bed to accede the alluvial sheet. As animals usually drink in the hole afterward reusing a hole means the existing water is first evacuated, allowing the hole to fill up with clean alluvial water. Remaining pools of the river are also used for washing, fishing and irrigation (moto-pump).

Water availability differs from one village to another also in terms of number of boreholes and wells, a consequence of the intensity of the last 15 years interventions in the region from NGO or government projects. In most of the case boreholes have been installed to encourage the return to normal life of war refugees (between 1992 – 1996) and in NGO post inundation relief activities (2002 – 2005). Many boreholes are very deep (70 m or more) and water yield often from much lower than expected. In some place as in Combumune, manual pumping is very difficult due to the depth of water and requires at least 3 adults.

Water quality differs from one boreholes/well location to another in the same village. Interviews underlined that population differentiates two types of bad quality for non-turbid water: saline and bitter[8]. Specific strategies are found to make the most of bad quality resources: mixing waters from different sources, using specific borehole or river for drinking water and salty one for other domestic uses etc.

Some houses have basic water harvesting system (usually used for washing and domestic purpose) (see photos annex5).. The government and NGO are incentivizing the development of such systems (see photos annex5).. For example it is recommended that no public building should be built without a proper water harvesting system: so the rehabilitation of the district office includes the building of a cistern accessible to the families of district workers.

History, situation (distance to the Limpopo river) and local context (saline groundwater) thus determines the situation of water availability in each villages as recapitulated in following table So globally 4 different type of water access level can be differentiated (Table 1). Local differentiation concerns the existence of borehole tapping good water with reasonable yield in the plateau area, the depth of the borehole (difficulty of pumping), existence of local depression in village near the rivers.

[7] The Park National Do Limpopo (PNL) is currently rehabilitating the road to make the left margin accessible all year long as it was difficult to pass during the rainy season.

[8] It is not clear what "*amargo*" (bitter) refers to. In one village it was also associated with green water. It would be interesting to try and connect the different appreciations with quality indicators as collected by WP2.

TABLE 1 : TYPOLOGY OF VILLAGES OF THE MABALANE DISTRICT DEPENDING OF WATER ACCESS

	Station village	**Rural village by the river on the right bank**	**Rural village by the village on the left bank (Ntlavene, Zona Tampão)**	**Rural village in the Plateau area**
	On the plateau, from 10 to 26 km to the river	Area privileged by external interventions notably in the South of the district (proximity of Chokwe).	Few interventions in the past 15 years.	Distance to the river Very limited access to water except local situation
Drinking and cooking system	motorized boreholes managed by CFM (Mozambican Railway) with tap water at water level for some; Some manual borehole	One to various boreholes, saline and none saline. Some small water system (pumping on river or motorized boreholes with solar panel)	Wells, river, and borehole when groundwater is not saline. The water of the river is often preferred. At the most one borehole by village	Small reservoirs/lake (protected against animals), wells and borehole if any. Water of different sources can be mixed to get better quality Yield of borehole and well is irregular as well as quality
Washing	CFM managed boreholes/small water system; Manual borehole	Boreholes Saline boreholes are exclusively reserved for washing, but some families prefer the river whose water leaves no traces.	Saline borehole if any. If not river water and river bed.	Small reservoirs
Irrigation		Motopump in the river when the meander of the river provide remaining water during the dry season	Manual when the plot is very close to the riverbed when the meander of the river provide remaining water during the dry season	Small reservoirs, manual irrigation only
Animals watering		Small reservoirs if any, if not river	Small reservoirs if any, if not river	Small reservoirs (dedicated generally)
Comment	A small system is being developed pumping water on the river with water treatment, to be managed by SDPI	New PRONASAR boreholes developed in particular in Combumune district		In Combumune, new PRONASAR boreholes

An increasing number of irrigation systems

SDAE lists 25 collective irrigation schemes and 82 moto-pumps, 6 being non-operational. We were able to retrieve specific data in Ntlavene and Combumune administrative post (interview of Post chief) but data has still to be collected in Mabalane-Sede administrative post.

TABLE 2 : IRRIGATION SYSTEM BY ADMINISTRATIVE POST[9]

	Private moto-pumps		Collective system/moto-pumps	
	operational	Non operational	operational	Non-operational
Combumune	6		3	
Ntlavene	25		6 + 1 construction 3 manual systems	2
Mabalane-Sede[10]	15		9	

Three main types of irrigation system were identified:

- Medium private one (PC farms firm, Penitentiary) above 20 ha[11]
  These are medium size irrigation systems with moto-pumps developed with commercial objectives. They have not been studied in this work.

- Small private irrigation system (ranging from 3 to 20 ha).
  Two types of small irrigators can be found:

  Sons of irrigators: During colonial times, successful migrants in South Africa brought back water power pump with diesel engine to develop private irrigation systems. Some of them could occasionally own several of these power pumps and irrigate quite a large area (up to 20 ha). Their sons thus accumulated experience and knowledge both of irrigation and water management by working on these farms and as far as possible kept on irrigating. Some lost their power-pumps during the war and flood and moved area, but some way or another managed to reacquire second equipment and proceed with irrigation.

  Another type of private irrigators has recently been emerging: farmers without previous irrigation experience that either benefited from FDD loan to develop irrigation or managed to recover disused NGO donated power-pump[12] (after securing authorization at district government level). FDD loan generally includes the power-pump, tubes, first year diesel and sometimes cost of fencing the plot. These farmers lack the experience of the previous ones but are generally connected to the most influent families of the village. They notably have access to good irrigation sites and high level connection that facilitate access to equipment.

[9] census in December 2012. These numbers have probably been affected by the January 2013 floods.
[10] To be checked the number of operational motopump.
[11] This type of irrigation system has not been specifically studied during this field work period.
[12] 2 cases met. In one case the irrigation association was no longer functioning; in the other case the NGO had donated a bigger power pump and the smaller one was not used any more.

- Collective small irrigation system

They are generally initiated with external support either a government initiative or a NGO project. The power-pump has usually been given as well as fuel for the first year of functioning and sometimes the association also received money to fence the land.

The irrigation model includes the creation of a collective area which is being farmed to provide for the cost of the moto-pump, while each members of the association receive a private plot which is managed independently. But in all the cases studied the production in the collective area has proved insufficient to cover the cost of the fuel and members of the associations are requested to provide money or fuel to keep pumping. As many farmers are unable in fact to contribute, the number of farmers involved tends to diminish over time: access to irrigation is restricted to a core number of families generally well connected which are able to provide the money on a regular basis.

Land for the scheme has most of the time been lent by a landowner which is included or not in the association. Occasionally land access is a conflictive issue that can block the development of the irrigation project or make it necessary for the association to move in another area.

Manual irrigation which has been promoted by NGO is considered as interesting only when associated to Food-for-Work mechanisms as it demands too much work for a too limited return.

Small collective irrigation system case 1

Six farmers irrigate 2 ha. The irrigated area is divided into two parts: (i) a collective part whose production is being sold to collect money to buy fuel (ii) plots managed individually. When the pump is being operated the work starts in the collective area. In one day the whole area is irrigated and members after a while can tend to their own plot.

The association was initiated by an NGO in 2005 which gave a manual pump to a group of 32 farmers under a food for work scheme for horticultural garden. After one year, the NGO provided a small power pump and some fuel while village leaders identified an area of 25 ha close enough from the river to allow for irrigation. But this area was in the middle of land that was later allocated by the government to a commercial farm of 250 ha, so the irrigation system was transferred to another area after negotiation to the plot “owner”.

Since 2006 there has been a regular decrease in the number of farmers in the association because of financial constraints: the product of collective farming was not enough to cover irrigation costs and farmers unable to financially contribute to the fuel spontaneously stopped farming and “resigned” from the association. Cultivated area also decreased as available labor decreased.

When the leadership of the village changed two years ago, the owner of plot requested his land back (to irrigate himself as he had a FDD irrigation project approved) so the area cropped was decreased to 2 ha. The association is currently working on fencing the new area. In 2012, the association has to dig a channel into the Limpopo bed to maintain access to water during the dry season.

Conflicts and cooperation around water: first elements

The term "*conflict*" is highly connoted in the context of Mabalane and refers to the problems[13] to communities caused by wildlife especially animals from the Limpopo and Banhine Park. Most of the time interviewees mentioned that they knew no water-related events of conflicts or cooperation and focused at first on wildlife/human conflicts, underlying the importance of this issue at local level. Only on more detailed discussion was it possible to identify existing tensions related to water access and water infrastructure use or development. A typology of the conflictive events is recapitulated in table 3.

Two types of water sources are being shared by different types of users: the river and in some Plateau villages with limited water resources some water sources (reservoir or boreholes used for domestic and animal watering). In the river, competition on the resources is a larger scale issue and deals with the release of water from South Africa/Zimbabwe. Locally the competition is more on the land / area that give access to the resource, notably during dry season than on the water flow. In villages with very limited access to water as in Plateau villages, village organization strictly regulates water access and conflicts seem to oppose more foreigners to villagers (cattle owner from outside the villages, charcoal workers) rather than different water users from the village. The more urban area (MabalaneSede and Combumune-Estação) seems also to face a wider and more differenciated range of conflict than in more isolated villages.

Many of the conflicts mentioned relates to contractual relationship between administration and contractors and the drilling of the PRONASAR new boreholes. Conflict between administration and contractors for the development of district infrastructure are frequently reported at national level and in the media and contractors being prosecuted for failing to a contract is not rare. The importance of this type of conflict underlines fragility of local contracting firm. Tensions over PRONASAR boreholes concerned the relationships between the administration and the contractor, the relationship between the contractor and villagers as well as the relationship between leaders and users. These tensions reveal the strategic importance of water in this district but also the difficulties to comply with the stated PRONASAR strategies (see last part of this report).

In every village conflicts between cattle and crop was mentioned. But they are particularly mentioned when they involved cattle belonging to foreigners or powerful actors in the village.

Traditional ceremonies are involved in conflict resolution mechanism at village level, notably those involving land. It includes community conflict around access to good irrigation potential. But the development of large scale farming in the area (notably PCFarm) has also been accompanied by local conflicts over land access. Competition over land with irrigation potential is likely to increase if the Mapai[14] dam is built. Although nothing have yet been decided, two private investors have already made enquiries in the district to assess the potential of large scale irrigation in the district.

[13] were mentioned: attacks of lion on cattle and humans, destruction of crops by elephants, attacks of crocodile or hippopotamus on human by the river.

[14] An old project that was reintroduced on the political table in the last years. It recently regained an even renewed attention with January 2013 flood.

But as reported by Funder (2010), a conflictual event is rarely isolated and should be seen in a trajectory of cooperative and conflictive interactions as reported in the following case (Box 2).

BOX 2 : WATER CONFLICTS: A TRAJECTORIES OF CONFLICTIVE AND COOPERATIVE EVENTS

Village C is a big village, with easy access and relatively close to Mabalane-Sede. In the 90s, an NGO supported the building of small water system (including pump, water tank, 1,5 km of tubes) pumping water out of the river. A water committee was created (with a bank account in Chokwe that is 100 km from the village) and was charge of collecting the water fees, the management and maintenance of the system.

At some point the pump stopped working and the village was unable to present enough money to repair the pump and asked the NGO to help. The NGO accepted to advance money for the reparation but the debt was to be repaid by the village, although villagers expected the repair to be free as the problem appeared after the 2000 flood. Because the villagers have proved unable to maintain the pump the NGO decided to take back the management of the system: a technician comes monthly to the village to collect the fees and bring fuel.

Villagers are complaining that the NGO does not present the receipts for the fuel nor a clear accounting concerning the debt payment. In the meantime the tubes have deteriorated and there is not enough pressure to fill the elevated tank so smaller plastic barrels are being filled. Consequently there is very little reserve whenever the pump works.

While the pump was not functioning, people reverted to other water sources such as the river, the saline boreholes and for those who could to Mabalane water. During the time the village organization around water went loose. Now that water is limited, there is huge confusion to get water and many conflicts in the queue line. The village leaders have tried to solve the problem by imposing a limited number of containers by families but the competition and confusion remain fierce. They hoped that a PRONASAR new borehole would solve the problems but although the PRONASAR technicians came several times and searched 6 sites (instead of 3) they were not able to identify a single non-saline water site.

So the village leaders decided to pressure back the NGO to have clearer accounting and have them repair or change the tubes. In November 2012, the leaders required to see the NGO director (by sending an oral message to the visiting technician) but had not yet received any answer when we visited the village. The leaders are also asking (in official meetings) the administration to review the “all borehole strategy” and consider adapted solution to each village situation – including reparation of small water system…

The following cooperative interactions were reported:

- Cooperation between administrative services to solve local problem of water access for irrigation.

  In one site, access to remaining water pools in the Limpopo riverbed was limited because of the drought. ARA-Sul managed to mobilize other administrative services to lend heavy equipment and dig a channel in the riverbed to bring the water to the moto-pump of an association.

- Cooperation between private actor and villages (3 cases reported).

In one case a private cattle owner contributed financially to make deeper a village reservoir so that both his cattle and village cattle could use it during the drought season.

In another case a private cattle owner brought a motor to pump groundwater to a cattle drinking scheme renovated by the government (previously build by the Portuguese and destroyed during the war) that was not functioning. As for the previous equipment provided by the administration the pump was not able to yield sufficient water and the private cattle owner has lost interest. The site (and equipment) remains guarded by government.

At last, a private farmer consorted with an association (his wife being the president of the association) to dig a canal in a river bed so that both his moto-pump and the association's one could work during the dry season. He also authorized the tube of the association to cross his plot of land.

- Cooperation between villagers to collect fund to repair pumps and boreholes (various cases reported)

- Cooperation between one borehole mechanic and villages

When solicited by a community to repair boreholes, this very well known mechanic does not necessarily charge for the reparation unless it has to move a large part of its equipment. In this case he charges a small amount. His income comes mostly by charging private actors to repair agricultural equipment.

TABLE 3 : TYPE OF WATER RELATED EVENTS OF CONFLICTS RELATED TO WATER

Nature of events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Noncompliance of contract concerning water infrastructure	District or district service versus contractor	Delay in the development of Mabalane-Sede small water system	Reported in the media	Involvement of the national level government (prime minister); Establishment of a local commission to monitor the development of the infrastructure. Lack of funding limited the activity of this monitoring commission. The water system is still non operational
		Delay and inability of the first contractor to drill the number of boreholes as stated in the PRONASAR contract	Interview	Revocation of the contract by the Provincial government and selection of another contractor (Chinese).
		Non-compliance to the contract norms in the building of a reservoir –although all payment was made	Interview reported but at justice level (Provincial level)	Justice procedure
Disagreement over types of infrastructure to be build	Local leaders/ services representatives/local administration	Disagreement over the type of water infrastructure adapted to local situation	Interview	As part of PRONASAR program implementation. Local leaders and civil society representatives complained on the infrastructure built (borehole with a depth over 100 m and Afridev pumps which requires the mobilization of 3 to 4 women to be operated) to the local administration. The issue was mentioned in local council. The SDPI services wrote a letter to Provincial level to request adaptation of the PRONASAR project so that other types of infrastructure than boreholes can be possible (end of 2012) In another case, FUNAE had projected to equip one of the water points of a solar system to create a small water system. But the water point is saline, and the local leaders have stopped the development of the project that was assessed as not adapted as villagers have little use of this saline water, would be reluctant to pay for the maintenance of poor quality water point.

Nature of events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Frustration over the refusal to build infrastructure due to quality of water resources	Local leaders, villagers, services representatives, local administration and contractors	Disagreement around the localization of boreholes - Boreholes sites identified by contractors (non-saline water) were recused by communities or by administration either because too risky (to close to river and subject to inundation), too away, on private land or on a road, creating tensions between these actors Contractor has not been able to identify non saline sites for boreholes drilling within PRONASAR contract. These created frustration and tension at community level. Different cases were reported - Water was detected in some site but it was assessed as saline. - Water was not detected at all Local leaders complained that - The contractor came without warning and did not necessarily prospect in the sites identified by the village - It did not necessarily prospect 3 sites. - Discussion with the contractor was not easy as they often come without warning and did not speak Changane	Interview, mentioned in different villages	Not all village leaders complained openly, only a few did share their frustration with local administration. SDPI received 4 official complaints (written down) The complaints varies from villages to villages (number of sites prospected, possibility of discussion etc). In some cases village leaders complained to local administration and stated their frustration of not having water. In some cases local administration and services representatives pressured the contractors to go back to prospect in other sites. Local service also decided to request the possibility to develop other infrastructure than boreholes. In the village that refused to proceed on the site proposed by the contractor, the contractor when came back did not connect with the village leader when they came back.

Nature events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Conflict related with development of infrastructure with external support	Local leaders villagers and NGO representative	Lack of transparency concerning the management of funds collected by village and managed by the NGO	interview	See Box 2
	Leaders and administration	In the urban village, users are complaining against the water tariffs	interview	Water tariffs of the water system is this urban center is higher than the other urban center which are at the moment both managed by the railway. Residents are complaining against difference (60 MZM/month instead of 25MZM/month)
	Between villagers/local leaders and local leaders connected to NGO	Transparency of management and leadership conflicts	Interview (2 places)	Distrust over the management of money collected for maintenance of water infrastructure (moto-pumps and small water system). In the two cases reported, it was linked to lack of transparency between leaders and villagers in their dealing with an outsider support leading to internal leadership conflict. A challenger generally used the issue of fund management to challenge the authority of the leadership leading to vandalism and/or retraction from villagers from the scheme. Tensions were exacerbated by the way NGO or external support (government in one case) initiated and developed the process of infrastructure development.
Conflict between villagers over same or different water uses	Between cattle owners and plot owner at village level Cattle owner may be resident of the village or outsider	Destruction of crops when cattle get to the river or reservoirs for drinking	Mentioned in nearly all villages. In 2 villages the conflict seems particularly acute	In all villages fencing the plots crop close to the river is necessary. Normally, plot owner is allowed to collect the cattle that wander in his plot and the cattle owner may be asked to pay a fine to the plot owner to get his cattle back. But in some case, when cattle owner are well connected to village leaderships or administration /party system at district level, these rules cannot be enforced. This can lead people to stop irrigating (mentioned in one village)
	Between water users/women in case of water scarcity	When the water yield is slow either because overconsumption or poor infrastructure maintenance, conflicts arise between women over queuing and volume collected	Interviews (3 places)	The general rule at all boreholes is that the women have to follow the queue (line of containers). When yield of water is limited, the number of containers per person can be limited by the local leaders but there still might be confusion. This kind of conflict is if possible solved at water committee level but they generally do not have the necessary legitimacy/aithority to do it and problem as being brought to village leaders.
	Between leaders and villagers	Access to new boreholes is closed until a proper fences has been done	interview	Leaders claim that the only possibility to mobilize the community for the fencing of new boreholes (or cleaning of old one) is to close the access (with a key) until the work is being done, which create tension inside the village especially where there are no other non-saline borehole as users are willing to use the new water as soon as possible
	Between villagers and outsiders	Restriction to a reservoir providing water access to a Plateau village	interview	Charcoal workers which are motorized are asked to fetch water at the river

3. What are the relevant public policies and external interventions related to water uses and vulnerability at district level?

At the moment three government programs or policies have a direct or indirect focus on water, food security and vulnerability: (i) the PRONASAR program, (ii) the local Development funds (FDD) used to promote income generating activities with priorities in the agricultural sectors, notably irrigation project and (iv) operation supported by INAS for the more vulnerable.

Because implementation of public policies is supposed to be integrated within the framework of decentralization that support integrated and participatory planning, this process and the different tools implemented at district level will be presented first. We will then present the PRONASAR program, NGOs program concerning water and food security in the district.

In this part, only the process on paper of the decentralization framework and the different program will be presented. Their effective implementation modalities and their impacts on water access will be presented in the following part.

Decentralization, integrated and participatory planning and Local Development Funds

The district government relies on a hierarchical structure which ranges from the district to the village (Table 4). The FRELIMO party also has its own hierarchical structure, from the district level to each community.

TABLE 4 : THE DIFFERENT LEVELS OF GOVERNMENT AT DISTRICT LEVEL

Administrative level	Person in charge	Related services	Interface with civil society
District	Administrator	Various services among which : *SDPI : in charge of works and development of infrastructure (road, water infrastructure) *SDAE: development of agriculture (including irrigation, fishing, cattle breeding), wildlife, charcoal production and economic activities Secretariat of District : planning ; organization of Consultative Councils	The Consultative Council (*Conselho consultative do distrito*) gathers some village leaders and member of civil society chosen by the district government
Administrative post (3) ("*posto administrativo*")	Post chief "*chefe de posto*"	Local decentralization services with aggregated services and local civil servant	The Administrative Post Consultative Council (*Conselho de Posto*) gathers some leaders and members of civil society of the administrative Post
Locality ("*localidade*")	Locality chief "chefe de localidade		In each locality a council of leaders gathers 1st scale leaders and 2nd scale leader

The institutionalization of local consultative councils[15] has been one of the most important political reforms at local level of the last 15 years in Mozambique (Forquilha 2011, Pereira 2011). They were first experimented in the North of Mozambique in the framework of participatory planning project with support of external donors. In 2003, these Consultative Councils were institutionalized with the *Lei dos Orgões Locais do Estado*[16] (LOLE) approved in 2003 (Lei 8/2003) and its regulation (Decreto 11/2005). Consultative Councils are established at the different level of district administration that is at district level, post level and locality. The District Administrator is responsible for establishing the consultative councils and the districts have budget to convene the meetings. In practice the general secretary of the district is in charge of councils. Each consultative body is expected to held two ordinary meeting a year and as many extraordinary meeting as necessary.

Their composition established by this latter regulation is based on representativity with at least 30 % of women.. These councils can range in size from 30-50 members at district level to 10-20 members at locality level. In practice they gather '*government, community leaders, secretaries of the FRELIMO party, civil society notably farmers and fishermen, health agents, education workers, influent individuals, religious leaders, representative of the private sectors , members of OMM (Mozambican Women Organization), OJM (Mozambican Youth Organization), ex-servicemen'* (Forquilha 2011)

Consultative councils are being associated with the process of decision making at district level notably to local planning. By law they are to be involved in the process of elaboration and approbation of the district plans either the District Strategic Development Plan or *Plano Estrategicos de Desenvolvimento Distrital* (PEDDs) elaborated on a 5 year basis and the annual Economic and Social Plan and District Budget Plano Economic e Sociais e Orçamento Distritias (PESOD) (Decreto 11/2005). These plans are important for water as they detail the infrastructure investments for the next year (PESOD) and 5 years terms.

Consultative councils by law also play a key role in the selection of project submitted the *Orçamento de Investimento de Iniciativa Local* (OIIL) also *called Fundo de Desenvolvimento Distrital* (FDD or Local Development Fund)[17]. Introduced in 2006 this fund aims to reduce poverty by funding individual projects of food production and generation of income and jobs by offering a credit opportunity to local people excluded to formal credit system. The total interest rate is 5 % but there is no strict rule for reimbursement. The few systematic studies on this initiative have underlined non surprisingly the larger access of local established elites to the fund and the global failure of reimbursement of the loans (Forquilha 2011, Pereira 2011). They also underlined the relationships between membership and structure of power of the district, notably of the dominating political party.

Mabalane is one of the 8 districts whose budget implementation is being monitored by the *Centro de Integridade Publica* (the Center for Public Integrity) an NGOs that promote "integrity, transparency, ethics and good governance in the public sphere" through qualitative research and information of the public. It indicates that within the 2010 OIIL the district received 6.742.800,00 MT allocated to 85 projects. 33 % of the project were dedicated to agriculture production, 58 % for creation of jobs and income (this includes commerce, agro-processing, small industries, transportation etc) and 9 %

[15] Different names in Portuguese : Conselhos Locais (Local Council), Conselhos Consultativos (Consultative Council), Instituições de Participação e Consulta Comunitária (institutions for ommunity participation and consultation)

[16] Law on Local State Bodies

[17] Locally known as "7 milhoes", the seven millions program/fund.

for cattle breeding. 28 % of the project leaders were women. It questioned the value attributed to one of the project over the 800 000 limits of the FDD functioning rules, underlined that the projects with the highest level were submitted by civil servants, underlined that 23 % of project were dedicated to public semi collective transportation which presented problem 2 months after being bought. Beneficiaries signed a contract with the district before receiving a cheque[18] and received a copy of this contract. The contract included the devolution period and the number of payment. But did not specify clearly how the payment was to be done. (CIP documents)

Since then more specific rules are being applied to the fund with strict limit to project depending of their activities, focuses on food production projects and small income generating activities.

	Mabalane-Sede	Combumune	Ntlavene
% of allocation by post (CIP, 2011)	39,4	29,8	30,8

PRONASAR: a national program for water and sanitation development

The National Rural Water Supply and Sanitation Program (NRWSSP), or PRONASAR **(**Programa Nacional de Abastecimento de Água e Saneamento Rural**)** is a program that "*aims to align and harmonize activities in the sectors, financed through various modalities by various actors such as Government of Mozambique, development partners, non-government organizations etc (Pronasar 2009)*". It is thus "*the framework for operationalizing and implementing the Rural Water Supply and Sanitation Strategic Plan (PESA-ASR) 2006-2015 to reach the Millennium Development Goals target of 70% coverage for rural water supply and 50% coverage of rural sanitation at national level, respectively*". This implies the provision of 17 000 new or rehabilitated water points and 151 small rural systems (Pronasar 2009): In Mabalane 30 boreholes per year are planned to be develop during 3 years as part of the first phase (2009-2011).

The program was officially initiated in 2010. Apart allowing for a better access to water and sanitation access in rural Mozambique, the program aimed at correcting the discrepancies in the water coverage between districts and provinces and promote capacity building in the WASH sector at local level. The program has four components *(1) Support to sustainable increase in rural water supply and sanitation coverage (2) Development of appropriate technologies and management models for RWSS (3) Capacity-building and human resource development in the RWSS sub-sector (4) Support to decentralized planning, management, monitoring and financing of RWSS.*

Concerning this latter components, the program explicitly state that it will promote and support *inclusive, bottom-up planning, improving the accuracy, completeness and communication of information for planning, budgeting and managing rural water and sanitation. The Program will also promote and support complementary cross-cutting approaches such as poverty alleviation, good governance and gender equity.*

The planning for PRONASAR water infrastructure within the program was supposed to be closely linked to the district planning process and involve the Consultative Councils. This included to

[18] In other district, beneficiaries do not receive directly money but the district has agreements with some retailers.

implement *district Water and Sanitation plans with decentralized resources, including the Common Fund, DPFP and other government and non-government resources, prepare/update and implement provincial water and sanitation master plans and district water and sanitation plans, Promote, implement and monitor district and local participatory planning, develop the SINAS (data based on water and sanitation developed at Provincial level) related databases operational at central, provincial and district level. Joint sector reviews, assessments and audits conducted and recommendations implemented.*

"*The National Directorate of Water (DNA) is responsible for implementing the Program at central level. The Provincial Directorates of Public Works and Housing (DPOPH), through The Department of Water and Sanitation (DAS), is responsible for implementing the Program at provincial level. At district level, district governments through the units responsible for rural water supply, sanitation, community mobilization and health promotion will be responsible for implementing Program activities. At local level, Community Water Supply and Sanitation Committees composed of village residents are formed and supported to assist in planning and to manage, maintain and monitor improved water supply and sanitation facilities*".

The PRONASAR has an explicit component dealing with participation and the most vulnerable groups. As stated "*In accordance with the Demand Responsive Approach (DRA), communities will be encouraged to express their priorities and demand for improved WSS services, play a central role in planning and implementing activities, and choose how they want to manage and pay for operating the completed facilities in a manner which is pro-poor and gender sensitive… The poorest and most vulnerable groups are identified as female headed households and vulnerable groups, i.e. elderly people, people living with HIV/AIDS, dis-abled or people with chronic diseases…* Three monitoring indicators of the program are directly targeting its pro-poor orientation: Incidence of poverty in village (% poor household), % water sources maintained by communities with pro-poor management rules and regulations, % of poor areas and households with access to water and sanitation.

The pro-poor approach includes a priorization of district and district area to develop the program's activity areas using poverty and equity indicators; prioritization of areas with low coverage and high poverty, and promoting the active participation of women; the use of participatory district planning methods and promoting traditional systems of social support[19] *to reach the most vulnerable group; building and use of poverty maps or areas with lowest coverage a identified during the Phase I of the Program;* making use of the participatory planning mechanisms at district level (from local development committee to District consultative council) for the participatory prioritarization; capacity building "*notably for women on building self-esteem, strengthening capacity to analyze problems and make equitable and gender-sensitive decisions, and capacity to negotiate, argue and persuade directed*" to be developed notably by NGOs.

As stated in the project document the selection process is expected to follow the following approach: 1) identification of priority areas; 2) community mobilization and demand generation, and 3) final selection of communities, as follows:

- *First, at a general meeting, community members discuss and agree on priority areas using agreed selection criteria*[54]*, including population size, availability of water sources, incidence of water-borne diseases, poverty and prevalence of HIV/AIDS.*

[19] Mutual aid system mostly see Ducrot, 2011

- *Communities' willingness and capacity to participate in and contribute to the improvement of their water and sanitation services will then be assessed and verified.*
- *Communities that meet agreed requirements will be selected to be included in the annual district implementation plan, subject to the availability of resources, on a first come- first-served basis.*

Selection of communities has to be conditioned to the respect of some conditions: up-front contribution in cash or in kind; formation of a water and sanitation committee, payment of full operation and maintenance costs, etc. will also be presented, discussed and agreed

The program also implies to promote local income generation and productive uses of water through mobilizing FDD funds and recommend using local mutual assistance mechanisms for dealing with specific cases of vulnerability. It explicitly promotes the participation of micro-entreprise in providing various water related services and hygiene and sanitation products, promotes work with small-scale contractors, suppliers and individual artisans in order to develop districts capacity ("*capacity to plan, undertake procurement, supervise construction, manage contracts, inspect and certify works and monitor progress")*.

Although the National Directorate of Water is recommending the AFRIDEV hand pump, the program will support testing and certification of alternative hand pump designs suitable for varying depths and water quality DNA will be expected to approve recently tested pumps, such as the Rope Pump, Playpump, and the Afrideep (see ANNEX 4 for presentation of the different pumps).

The program also plans for the establishment of a water district forum which would be set up as subcommittee of the district Consultative Council to discuss all issue related to water at district level.

Other interventions: Limited direct impact on water

Some activities of INAS for absolute poverty alleviation could have direct impact on water

INAS[20] is in charge of the development of social security program and activities in relation with absolute poverty alleviation, among which basic social direct subsidies, direct support to older people and orphans children, assistance to disabled people, and food security program based on a Food-for-Work scheme. In Mabalane at the moment, basic social direct subsidies concerns 718 families (13 % of the families) which receive monthly between 130 and 380 MT[21] depending on the number of dependents. Eight villages were selected jointly with the district administration to receive this program, all of them located on the right bank of the river and mostly in the Mabalane Administrative Post. It targets mostly elders people notably widows, women head of families with a large number of dependent and head of family with chronic disease. There is no direct links with water access but this program provides a secure monthly income even if very small to a very limited number of families

In 2012 a new pilot program supported by PMIA and World Bank is being implemented in 11 communities of the district (Right bank of the Limpopo River mostly Mabalane-Sede and Combumune). This program which lies on a Food-for-Work scheme aims to provide food to selected members of the communities against the development of activities of common interest for the community. NGOs are expected to help communities to propose and submit projects. Two types of

[20] Instituto Nacional de Ação Social – National Institute for Social Action
[21] Between 3,25 and 9,5 euros/month

project could have direct links with water: building or maintenance of small reservoirs and production of bricks. Yet at this stage none have been planned in this district. Most projects proposed relates to the cleaning of road, the development of fruit tree plantation or tuber crops (sweet potatoes, cassava). Yet in the past some village have rehabilitated small reservoirs through Food-for-Work schemes within drought relief interventions. INAS had also supported the development of two small collective irrigation systems in the district[22].

Agricultural policies: some limited initiatives

There are no real structured policies or strategies concerning agriculture in the area but a series of interventions related to different programs coordinated at provincial or national level. SDAE main activities are the multiplication and distribution of seeds (in particular cassava and sweet potatoes), production and dissemination fruit tree seedling (Caju), demonstration plots for horticulture crop (4 plots), and the treatment and vaccination of cattle and poultry. Breeding is of major importance in the area but intervention concerning cattle is limited to vaccination and treatment.

SDAE and some NGO programs also promote "conservation agriculture" although the agriculture model behind this term is generally vague and mostly focuses on dry cover production and demonstration plots with new species (sweet potatoes and cassava) and facilitating access to certified seeds.

Irrigation development results from (i) individual initiatives supported by FDD funds (ii) local activities of some NGO and PNL to communities of the buffer zone that promote small collective irrigation schemes. The FDD system favors private medium scale irrigation scheme funding both the acquisition of the equipment (moto-pump and tube equipment, fencing) and fuel up to 200 000 MT which have to be repaid (on paper). The model of collective irrigation favors schemes of 5/10 ha scheme gathering 15 to 30 farmers around the management of moto-pump. SDAE provides punctual support to existing irrigation associations or irrigators but its intervention in this area is not clearly structured.
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NGOs interventions: no more water specific approach

No NGO[23] develops specific water intervention in Mabalane. Two of them provide general support to selected communities. Both have been involved in the district since the 90's and were thus involved in emergency and relief operations to war refugees and the 2000 flood which included the building of boreholes (LWF) and small water system (CARITAS) and small collective irrigation system, manual at first and then motorized.

LWF strategies evolved in 2010 to follow a "human right approach" founded on empowerment and capacity building of communities and minimize direct contribution from the NGO. In parallel and in coordination with the district this NGO have moved away from its initial location (richer villages southern part of the district) to move to the poorest administrative post of Ntlavene in the PNL buffer zone. In this area among many others activities, they are involved in the promotion and development of small irrigation schemes.

[22] These initiatives had not been mentioned by INAS staff. Their development may have been linked to specific drought relief program, to be clarified.
[23] Two of NGOs with water related activities are local branches of international NGOs of religious obediance. The last NGO is a national one with international fundings

CARITAS have maintained more traditional intervention modes based on direct training and direct support. Among other activities (education on hygiene and nutrition etc) they support the development of small water harvesting tanks, "sustainable" agriculture and small irrigation schemes. Communities have to provide for 30 % of the capital cost of any of investment and CARITAS use a rotating credit model to expand its activities. Sustainable agriculture relies on classical dissemination techniques (demonstration plots etc) and focus on organic fertility, conservation agriculture (dry cover, crop rotation).

Each of them develops their own management structure at community level. NGOs are supposed to report their activities to the administration services to which they are registered on a monthly, semi-annual, and annual basis and their achievement are being integrated in the services reporting system.

The last NGO with relevant activities to water and food security is directly embedded in the Agricultural District service (SDAE). Under Helvetas funding, this NGO support the development of farmers associations through training, delimitation and regularization of community land and forest, support to the legalization of the association and support to the legalization of the land rights (DUAT). He is notably involved in the support to irrigation associations to get their DUAT. The NGO also act as an intermediary to facilitate the commercialization and production of irrigated crops for example by promoting joint venture or commercial links with private retailer. In 2012, LUPA contributed to the registration of 7 collective grazing areas for a total area of 25 500 ha (SDAE, 2012).

Limpopo National Park and the communities of the park buffer zone: supporting irrigation

A large part of the Ntlavene administrative post and some villages of the Combumune administrative Post lie within the limit of the buffer zone of the Limpopo National Park (PNL- Parque Nacional do Limpopo). In total 18 communities of Mabalane (10 in Ntlavene post and 8 in Combumune Post) situated in the left margin of the river are within the buffer zone[24].

The park is supporting the communities living within the border of the park through the project "Programa de Apoio Comunitario" (Community Support Program) funded by AFD (French Development Agency) 2009-2012. This program is notably been responsible for building of a fence to impede the incursion of elephants in the farmers' plots on a line linking downstream of the Massingir Dam to the Hassane village in Mabalane: a large triangle between the Elephant River and the Limpopo will be reserved to the communities. The project also developed of a non-tarred road that will permit access to the villages of the buffer zone all year round and organize the the resettlement of the communities located in the center of the park (outside of the buffer zone).

The Community support program also supports the development of irrigation schemes with an objective of 30[25] to be developed in the buffer zone. In Mabalane at the end of 2012, four irrigation schemes had already been created[26] and two were being initiated[27]. The methodology includes meeting at community level to select community that are interested and willing to invest time in the development of the scheme, selection by the technician of an area adapted for irrigation, development of the scheme and installation of the equipment, support to the association for the first

[24] Differently to other park in the world, the buffer zone of the PNL directly lies with the limit of the park
[25] Objective to be checked
[26] With one nonfunctioning due to land conflict
[27] Psitima, Nhanganga, Ndope, Hassane created, in process Chimangue and Matatufa

year of cropping and capacity building around irrigated agriculture, development of demonstration plot. LUPA is also in charge of capacity building of the associations and their legalization.

At last by law, 20 % of the government income related to natural resources has to be reversed for the communities. In the area studied this concerns the park income to be reversed for the communities affected by the park and normally the charcoal taxes. In the past the government gave back the 20 % to the park which in turn gave a check to the park committee[28] that had a bank account in its name. The committee was responsible for managing the money by presenting projects for the communities. But this procedure was changed at the end 2012: From now on The Ministry of Tourism will pass money first to the Provincial Government which will in turn pass it back to the District (in the district bank account for natural resources). This money in turn will be added to the FDD funds but only accessible to communities of the park through presentation of individual project following the FDD models and procedure.

4. The district as the locus of integration of public policies?

The main programs related to water, food security and vulnerability and their framework of implementation have been presented in the previous part. This part aims to analyze how they are concretely being implemented and how the implementation modalities impact access to water.

We need first to understand the interface between communities, government and NGOs. This includes community leaderships. Public interventions and externally supported activities are being developed within the framework of decentralization and should be integrated in the district plan developed with the involvement of the Consultative Councils. Although the work does not aim to analyse and characterize in detail the functioning of these consultative councils or anthropological aspects of social functioning of the communities, we have to understand how the composition of the council, the way members were selected, interactions between member or the interactions between leaders, communities and government interacts with water access and water uses at district and local level. In particular, we tried to understand which contentious issues were being raised during the councils through interviews and consultation of councils minutes and more specifically the issues raised by community or civil society representatives, the involvement in the planning mechanism notably concerning infrastructure, and how PRONASAR program was being discussed during council sessions. We also tried to understand the FDD project selection process to assess what kind of criteria was being used. At this stage of the research we did not have the chance to participate to a consultative council. At village level we try to understand what were the role and task of the different authorities at village level. At this stage our objective was less to understand the details of social and political functioning at village level that the range of issues and variability of functioning relationships that could be found. Complementary analysis is necessary to better understand some of the relationships that were pointed out.

[28] Gathering 6 representatives of the communities of the park, 2 representatives for each of the 3 districts covered by the Park.

What interactions with local communities?

Local leadership: Elected representation and traditional chief

Officially the administrative staff is in charge of interacting with local leaders. Three different types of leaders are being differentiated: The 1st scale and 2nd scale leaders are elected while the 3rd scale leadership is hereditary.

The 1st scale leaders are elected leader who represent 3 to 5 villages corresponding to the administrative level of Locality while a 2nd scale leader is elected in each village. Bigger villages are divided in different part each one with its own 2nd scale leaders. First scale and second leaders are in charge of all matters related to the interface between the government and villagers notably of tax collecting but also infrastructure development. They are entitled to receive from the state a small allowance as well as uniforms and the national banner. Elections are being carried out after a leader death and are organized by the Locality government. Election seems to be quite competitive with many candidates but this may vary from one village to another.

The 3rd scale leader is in charge of performing the traditional and religious routines. He has no responsibility with administrative or official tasks (tax collection, relationship with government with infrastructure development etc). He comes from the traditional local chiefdom family that owned the land. Most of the time the 3rd scale leader is thus in charge of land allocation but his effective power and the role of the 2nd scale leader in this matter seems to vary from village to village depending of the relationships and family connection between 2nd scale and 3rd scale leaders. In any way, he is a gatekeeper in anything related to traditional ceremonies which includes ceremonies related to internal village conflicts.

Each leader has his own council of advisers (or "*indunas*") composed of one to various advisers and persons in charge of police, supervision and respect of rules. Legally, villages are divided in further administrative division (blocks etc) and there might to be some overlap between block and sublock chief and leader advisers. A problem is normally expected to be solved at the lower possible level (block level). Only if impossible is it supposed to be brought to higher level to village leader level and occasionally to Administrative Post or District level.

Women have their own hierarchical structure with women leaders identified from neighborhood to block and village level but unlike for men this structure is not officially endorsed by the state. Women leaders are necessarily directly connected to 2nd or 3rd scale leaders or *indunas* although as women of importance they are probably connected to the most respected families of the villages. A detailed anthropological study in each village would be necessary to identify the detailed relationships between the different leaders, their advisers, women's leaders and family connection and this was not undertaken in this study. Only if women are not able to solve their conflicts within their own leadership is their conflict being brought to the 2nd scale leader by the village women' leader.

There seems to be different configurations of power, relationship between leaders (2nd and 3rd scale), leaders' and indunas' roles and number of *indunas* in each village (see Box 3). A specific anthological study is necessary to identify the complexity of this relationship in each village. In any case at least in the smaller community the relationships between leaders seem to be essential for the mobilizing capacity of the 2nd scale leaders.

1st scale and 2nd scale leaders officially interacts with the government official by participating in the Leaders' council (at Locality level). Some are also selected (by the government) to participate to the Administrative Post council and/or District Council along with other "respected" representatives (men and women) from villages (Post and District level).We need to more clearly specify how the selected individuals how this individuals are connected to the different families of the villages inclusively *indunas* and traditional local chiefdom families[29].

Indeed government officials can also have direct relationships and links with one community, for example entrusting one leader for the management of his herd. It is probably interesting to understand how this type of relationship was been built and is being maintained along time.

*The role of consultative bodies and political meetings ("*comicio popular*")*

The District secretary is in charge of the organization of council meetings paying for example for the transport of village representatives and occasionally other expenses (meals etc). Even if their transportation costs are being compensated travelling can be an issue in an area where there is no regular motorized transportation outside of Mabalane market day[30].

The leader council (locality level) gathers **all** 1st scale and 2nd scale leaders of the locality. The council level at post level and district level gathers representative of the government, some civil servants (teachers, nurses), designated leaders and designated members of civil society (representative of local organization or individual with acknowledged economic or social activities). Members are coopted and designated by the council to fulfill the theoretical compensation of each council as defined by the law (numbers or percentage of women, number or percentage of representative of civil society etc). How the selection is being done has yet to be clarified but council minutes underlines that council membership are updated in nearly all councils.

While civil servants and technicians most of the time align with the political position as defined by high level (party related) civil servants, some representatives of civil society may have more independent positions, question activities and programs of the district services and raise relevant questions. At post and locality level, consultative bodies have a more top-down functioning, focusing on disseminating district government information and often perceived as an educational forum for leaders.

Government officials are supposed to visit their constituency on a regular basis and hold meetings with the communities in order to have direct interactions with villagers. The number of the villages makes it difficult for the administrator to visit each of them more than two times a year even by following a strict monthly visit routine. Post chief visits to communities are irregular and most of the time connected to a higher level visit (Administrator, Provincial or National level visit). Thus only the locality chief has a more or less regular interaction with communities and villagers. It derives that information to villagers transit most of the time through local leaders and discussion at village level underlines a general lack of transparency of many issues at village level.

[29] One member of the district council as a successful and respected farmer is also part of one of the most important local chiefdom family; His brother is the (1st or 2nd scale) leader of the locality where the administrative post is located.

[3030] Every Thursdays. During other week days it is possible to be picked up one on the Chokwe– Mabalane-Mapai road, notably if you arrive early enough on the road but most villages are located far away to this road (more than 10 km sometime around 40 km). Ntlavene villagers have also to cross the river to reach Mabalane.

This consultative system is completed by visits from government and/or party officials from provincial level (governor, department level or party) or national level (ministries, presidency or party) either as part of monitoring the implementation of national policies or local administration. At least one "high level" visit can be expected each year in each post which generally includes some field, new equipment and/or village visit. These visits are important political events where local administrative and technical staffs strive to present their activities at their best and visitors want to prove their ability to answer local demand. Consequently the preparation of these events mobilizes the different level of district government (from district to village) and services, and this directly interferes with project and program development: the building of specific infrastructure might be pushed up to be ready for a specific visit without taking the adequate time for consultation and training of beneficiaries.

BOX 3 : EXAMPLE OR ROLES AND RELATIONSHIPS BETWEEN LEADERS

Village A: The 3rd scale leader is the young elder son of the former 3rd scale leaders but he refers to a council of older men of his (extended) family for any decision concerning land; Land attribution is then confirmed and officially validated by the 2nd scale leader who is his uncle.

Village B: The strong older 3rd scale leader with well recognized power keep a stronghold on the community, while the young 2nd scale leaders seems to have a mere role of interface with the government structures.

Local committees institutionalized by project and program

Each program or projects (including NGO program) intervening at local level also generally develop its own committee or commission following its own rules and approaches often specified at national level (number of people, function and role, selection of representatives, type of works, gender etc). These external interventions rarely take the time to clarify the links of these committees with the village power structure: our interviews underline that these committees generally mobilize the advisers of local leaders (and women familiars of the leading families). A more detailed ethnological approach is necessary to better understand the complex relationships between village leaderships and the various responsibilities in the different ad-hoc committees. Yet the complex relationships at village level can be reenacted through these committees: in one village the irrigation committee was clearly the place where counter power to village leadership was being expressed and fought.

BOX 4 : EXAMPLE OF RELATIONSHIPS BETWEEN LEADERING FAMILIES, ADVISERS IN THE CONTEXT OF EXTERNAL INTERVENTION

In Village N, the leadership of the 2nd scale leader is contested, as acknowledged by himself and other interviews. The 3rd scale leader authority does not seem being questioned.

The village conflicts have been fueled by external top down interventions of the last years:

In 2009/2010 the government (INAS) decided to develop a multi-dimensional intervention in this village including an irrigated scheme of 20 ha, a school, aquaculture and cattle breeding. The villagers were not consulted and they were just informed that the village had been selected. Only three components were initiated: the rehabilitation of the school, the irrigated scheme and the cattle breeding scheme. None of these components were actually finalized.

Initially the scheme aimed to benefit 50 villagers. INAS would fund the power-pump but the village has to clear and fence the cropping area. Ten villagers would also receive goats but would commit to give the offspring to another family the following year. Family has to choose between one or the other option. The governor (Province level) was to visit the district in 2010 so the district government decided to accelerate the development of the scheme by giving fuel for the pumping, seeds and money for the fencing and fertilizers. It was also decided to prepare only 10 ha to be sure to be ready for visit of the governor. The rest of the scheme would be developed latter. Consequently only 20 villagers would be included in the association instead of 50. The selection was based on a first come first served basis. The 3rd scale leader donated the land against the promise that he would receive the double of the surface than other villagers which was agreed by the government but later on recused by the association. He then left the association.

This first (demonstration) year was satisfactory but in the second year they did not have enough fuel and irrigators were requested to contribute to fuel. The number of irrigators dropped down. They were no support at all from the agricultural service after the governor visit. The last campaign was even worse and only a small number of persons has mobilized to crop this season. They were also transparency issues and a new election was carried out. The 2nd scale leader family claims that his wife received the highest number of vote but the village could not let women be the president so she was only assigned the role of secretary while a young adviser was elected president. They defend two separate view of the scheme. While the secretary support individual activities in the scheme the president defend the initial model of collective cropping.

In 2012, LUPA intervened in the village to regularize the communal forest - inclusively securing private forested area for the leaders of the village as they claim to be entitled by the land regulation. It also included a support for the irrigation scheme including regularization, gift of plants and a support to get credit. A request for credit was elaborated on an individual basis (secretary's position) while the president wanted the credit to be requested in the name of the association. Only a small number of irrigators (6) were included to the credit request and other members of the association has not been informed or associated to the demand.

All villages have a water committee[31] in charge of the management of boreholes. It is generally borehole based (one committee for each borehole) although in a couple of village only one management committee is to be found. The main responsibilities of water committee are water fees collection and maintenance of the borehole. In many villages the committee have a strict implementation and execution role and the members of the committee undertake the management tasks under the control and responsibility of the village leader(s) whether this leader has been appointed head of the committee or not. If the committee failed to provide adequate maintenance

(for example for insufficient collected money), only the leader has the power to organize a village discussion and mobilize for an exceptional fee collect. It is possible that the water committees in very large village, notably Mabalane-Sede and Combumune-Estação are more autonomous although the differentiation of water quality by boreholes may result in a village approach of water management (by opposition of a borehole approach). Because water is a public good

Specific mechanisms of interactions for water resources management and administration of the park

Water resources management at catchment level mobilizes its own consultative committee, the Catchment Committee. A first analysis of the functioning of the catchment committee (Ducrot, 2011)

[31] The composition of each committee was not formally analysed at this stage but the same model seems to be found in all village with a president, a secretary and treasurer. To be verified.

underlined (i) the lack of representatives for small-scale water users or irrigation and water users from the upstream catchment (north of the confluence of the Elephant River with the Limpopo River). Only larger water users notably representatives of irrigators of the main irrigation area of Chokwe and Xai Xai are represented. Actually ARA-SUL has not yet initiated the census of users in the upper part of the catchment. Yet it is aiming at a larger involvement of the upper part of the catchment and the a Catchment committee was held in Mabalane in November 2012 (ii) it is according to the minutes principally **an information body**: it is the mean for the water authority to disseminate information concerning the hydrological state of the basin and the advancement of the work in infrastructure projects. As in the District Consultative Council crucial issues are occasionally tackled during the discussions even if they have only discussed superficially and often being put aside. An on-going research investigation has also identified people that are being charged by ARA-Sul to disseminate information at village level in Massingir (E Pragmaan[32], pers. Communication) but such intermediaries were not identified in Mabalane.

The Limpopo Park has also its specific interface through the Park Consultative Council gathering 2 representatives of each district. These members were elected in 2006. The Committee held regular meetings: in 2012 it held 3 ordinaries and 3 extraordinary meetings. The council used to be in charge of managing the Park compensation fund (the 20 %). Yet if interaction between the council and the Park administration is regular, information from the representatives and the villagers remains unsatisfactory. Village interviews underline a deficiency of information of the council activities. Consequently the Park technician supporting irrigation in Ntlavene district plays an important role of interface with the communities of the park. This communication and coordination role is all the more important that interactions with the park guards are often conflictive[33].

Gender issues: some consideration

Because of traditional migration to South Africa of men, polygamy and the high level of HIV in the area rate women plays a fundamental role in agriculture and water access. It is common to have women in water and irrigation committee, as well as receiving land within irrigation association in their name. While women may receive responsibilities at village level, difficulties sometime arise if these responsibilities imply leaving the village for a certain amount of time (for example for training) as husband may object to his wife to travel. Widows also may have difficulties to keep the plots of their deceased husband especially in the most fertile area – that is the flat area close to the river - although this varies from village to village probably depending on the availability of these most fertile land.

Boreholes are generally women's business meaning that most of the time water committee are mostly feminine. But in some Plateau villages with very limited water access[34], water is a man business with men controlling the water committee, but also in charge of manual pumping.

[32] E Praagman. "Water policy adaptation in the Limpopo Basin, Mozambique : Stakeholder participation at different levels". International Land and Water Management, Wageningen University, Netherlands. Thesis expected 2013."

[33] Negative reference to the guards comportment in interviews but also reported in Consultative Council minutes

[34] In one of the village water stress was so acute that cattle was being watered with borehole water at the price of 25 MZM per head a month (50 MZM/family a month for drinking water).

In spite of good intent, limited impact of the water program for the poorest

PRONASAR: first results[35]

In December 2012, the PRONASAR had permitted to build 30 boreholes (15 remained to be finalized). The next table recapitulates the outcomes of the water investigation and drilling in Mabalane:

TABLE 5 : PRONASAR DRILLING OUTCOMES

	Mabalane Sede	Combumune	Ntlavene	Total
Total nb of communities	24	24	17	65
Nb of communities to benefit from a boreholes initially planned	10	10	10	30
Nb of communities investigated by PRONASAR	16	15	10	41
Total number of investigations	17	22	11	50
Nb of communities where technical firm was unable to detect water	3	1	2	6
Nb of local where investigation detected water	14	21	6	41
Nb of communities/local where analysis of water was saline and no boreholes drilled	10	0	3	13
Total nb of boreholes built	4	20	6	30
Nb of boreholes developed in second semester (late identification	4	9	2	15

During this first year of the program where only one third of the total number of infrastructure was planned, 63 % of all communities were visited by the PRONASAR drilling team. They were unable to detect groundwater table in 14 % of these visited communities. In nearly a third of sites were groundwater was detected the water was saline and as planned in the contract no boreholes were built. The Mabalane administrative post was particularly problematic as only 25 % of the communities visited received a functioning borehole. On the other hand all visited communities in Combumune received at least one borehole. The hydrogeology situation of the district is indeed particular with groundwater sometimes deeper than 100 m and often saline.

The first technical contractor had underestimated the difficulties of borehole drilling in Mabalane due to the distance to the city main services (bank and fuel), the state of road and access difficulties, the depth of ground water proved unable to deliver the number of boreholes and only drilled 3 boreholes out of the 30 initially planned during the first year. His contract was consequently revoked and a new contractor selected (a Chinese consulting firm). The contract renegotiated the deadline of the project. The contract planned that in each village the contractor had to investigate 3 sites to be selected by the community and that only sites which presented non saline water would actually be equipped.

[35] To be confirmed by futher interviews at national and provincial level, delayed due to the flooding situation in January 2013 which disrupted avalaibility of main actors

The social aspects of management was contracted to a Mozambican firm based in Maputo called 3As but there were various difficulties[36] in the implementation with delays in payment which resulted in delays in work development; Among the delay, a couple of months before the end of the contract the forum has not been organized neither the maintenance network properly organized.

Because of the delay, at village level boreholes drilling was disconnected from the work developed by 3As. Most villages associate the work developed to sanitation and education in environmental issues rather than capacity building toward water management as a whole.

A focus on hand-pump boreholes: a contested choice

In 19 of the 50 visited villages it was impossible to identify sites with non-saline water and this created many frustration and tensions accentuated by deficient communication and information. There were related to different causes: delays and disconnection of the work between 3AS and the Chinese firm, language difficulties with the Chinese contractor (only the drivers spoke Portuguese / shangaan), limited information concerning the choices of the program, its development and problems met.

Although the choice not to equip site that proved of inadequate quality is reasonable as maintenance of saline boreholes is often deficient, in some village no other water option villagers would have settled for a saline borehole rather than being excluded of the program. In some cases, the contracting firm did not investigate the 3 sites as initially planned; In some village they simply discarded the sites proposed by the village to investigate other sites but claimed not to have found adequate good water site[37] which exacerbated frustration. Globally more than half of the village visited mentioned disagreement(s) over the sites investigated by the firm.

To comply with the quota of 30 boreholes to be built during the first year, the district decided that boreholes would be built in any village and place where the consulting firm could identify good water source. It was decided to extend the number of boreholes (i) in populated villages where good water points had already been identified, as it was likely other good points could be found (ii) in any other villages where the consulting firm could identify non saline water sources. This decision of the administration services was at no point shared with village representatives or consultative council.

Thus some villages of Combumune post which has access to non-saline groundwater received a certain number of supplementary boreholes. Their localization was broadly decided jointly by the consulting firm and the village leaders in order to have a good spatial distribution of the water points but the specific localization was decided by the consulting firm.

Yet some of these boreholes are very deep and pumping particularly difficult requiring the mobilization to at least 3 or 4 women and members of Consultative Council are contesting the choice of handpump boreholes in this situation[38].

[36] Yet to be clarified

[37] Such comportment might be justified by the localization of a village situated on a specific geomorphological situation that had been already been investigated in other sites by the consulting firm: But it is difficult to understand by communities with very limited availability of water.

[38] At this stage, it has not been studied why other type of pump more adapted to the high groundwater depth of groundwater have not been experimented while test how new equipment was planned in the PRONASAR program document

If leaders of some discarded villages succeeded in getting the firm back to their village and identifying adequate site in the village by actively complaining to the administration and mobilizing their network, some villages have remained without water. In some cases further investigation did not even succeed to identify non saline groundwater point.

These difficulties, the wave of complaints and frustrations have led the administration to request a change in the PRONASAR strategy and the authorization to invest in other type of water infrastructure than hand-pump boreholes. In the case of Mabalane, some villages could be supplied (as in the colonial time) by small water system pumping water in the river (although flood risk may be a problem), motorized boreholes with solar panel in deep groundwater or building small reservoirs in the Plateau river. They argued to the price of boreholes in the Mabalane condition is very high and it could be economically justified to consider other options.

An initial involvement of district actors (both administration staff and leaders, or Counsultative Councils) in the design of a project implementation plan for Mabalane would probably have help to raise the issue of the suitability of all handpumps choice to the local reality and avoid the tensions and difficulties that the project created. Actually, a project for the development of reservoir and 20 cisterns was cancelled in 2012 because of the internal financial crisis while many specialists levels considers it is the only viable solutions in the Plateau villages while answer to the cattle watering needs. It is also possible that an effective consultation of local communities and local knowledge could have in some case allowed to identify more rapidly adequate site.

A deficit of information and communication on the project development

While the program was presented at Consultative Councils levels at its very beginning there were few references in the councils 'minutes to its development and problem met. The change and adaptation of the program due both to the contentious relationships between contractors and administration and the geomorphological reality of Mabalane would have required larger information and communication which has obviously been neglected. Government services technicians, leaders and civil society representatives at post level acknowledge that information concerning the development and adaptation of the program has been insufficient. Administration Services attribute these deficiencies to the difficulties and delays in the social and institutional components of the program. It remains that workshop and meeting follow a top down line which focus on education of participants rather than sharing information[39]. If many questions are being raised by participants at the end of this type of "workshop", they receive incomplete answer and sometimes they are discarded. The workshop we attended aimed to discuss the provision for maintenance. Yet the "discussion" was limited to the existence of a contract between retailers and district, while a large part of the meeting was devoted to a lecture on sanitation practices. The contract clause was not even read to participants so that leaders could be aware of the expected responsibilities and roles of the different actors. Yet the workshop will count as maintenance workshop.

The forum of water is expected to facilitate communication and information but other canals of communication could be used to facilitate a large dissemination of information such as communitarian radio. They could be useful for large scale educational program as well as disseminating information about adaptation and development of the program.

[39] This applies also for other area such as basin committee meetings

A district role limited to supervising compliance to project quantitative objectives

As the discrepancies between the program orientation and the situation of Mabalane underlined it, the district level had a minimal contribution in the design and development of the program. The program, including contracting is being managed at Provincial level; The small urban water system in development for the rural city of Mabalane is being managed at central level (DNA).

The role of the district is thus limited to accompanying and monitoring the implementation and development of the program. They have no margin at all to adapt the program to the local situation or events emerging during contract implementation[40]: For example, when it appeared than it was difficult to identify enough water sites, they could have consulted the Consultative Council or leaders to decide what would be the most appropriate adaptation strategies. But this would have resulting in delay and failure to the contract terms. Its main responsibilities are to implement the monitoring plan, monitor the consulting firms works and transfer indicators to the Provincial (or National) level. Consequently they emphasizes the role and respect of norms and indicators (number of committee formed etc) rather than matching the program philosophy.

As the delay in the implementation of the program increased, the importance given to these quantitative indicators tended to increase too. At the start of the program the district government refused any private demand (for example the jail and public school requested water access) although providing for these institutions would have helped to cover indicators as boreholes to the jail would provide for 700 people. But they decided to increase the number of boreholes in Combumune-Estação although many local leaders would preferred a small water system they believed more adapted to the situation. Increasing the number of boreholes (5 new boreholes) in this populated village will help reach the norm of 1 water point for 300 people although people complains on borehole functioning.

This “indicators and access” logic is explicitly accepted and acknowledged by medium level actors that states that they always have double strategies when selecting areas : to areas with real need but also area where they expect rapid visible outcomes that can be show off to donors or high level political visit. This strategies largely explains why the southern villages of Mabalane have relatively a much larger number of equipment or intervention than other villages of the district and why the left bank of the river is comparatively much less developed although the issue of access is also often used by all level as an excuse not to ask for respect of program.

The implementation modalities in practice limit the pro-poor impact of the program

The focus on quantitative indicators led the program to lose its propoor orientation as the program had to adapt to the implementation reality.

In order to avoid the perception that one post would be favored over another a district which is globally lacking water access, it was decided at the beginning that the 30 boreholes would be equally allocated in the 3 administrative posts, meaning that 10 boreholes would be built each year in each Post.

[40] The perspective of the provincial level on the difficulties encountered has yet to be assessed.

At the very start of the program, the program was presented at the Local Post Council and a vote was organized to select the 10 communities that would benefit from the first ten boreholes. Although this procedure did not follow the recommendation of the program the involvement of the Post Consultative Council was transparent and globally acceptable for all leaders as it was based on assessment of the village that were particularly disadvantaged. Selected villages complied with the commitment letter as requested by PRONASAR.

As already mentioned, it rapidly appeared that it was going to be difficult to actually provide safe and good water for all these villages. Yet the contractors had to respect the term of his contract in the imparted deadline and the district to achieve their normative objectives (number of boreholes short and in medium term, number of boreholes by person). The strategy chosen completely discarded the initial pro-poor orientation and in this second phase of the project sites were selected either (i) in village with larger population and poorly provided with identified source of good water has been easy to identify (ii) any other villages chosen by the firm where it could identify good water sources.

Consultation of the communities even to select the investigation sites in a village were forgotten in the process: Most of the time leaders were not previously informed of the visit of the drilling firm and had not time to consult the community to select potential sites. In several cases the choice of the sites to investigate during this second round of prospection was an initiative of consultative firm. In at least one case a borehole was built on a private property, without discussion with the land owner. Village with easy access or close to Mabalane received repeated visits and investigation while remote village were not visited. Discarded Villages with well-connected leaders or leaders that did complain to administration had more chance to receive a supplementary investigation than those that silently agreed to the claim “that they had no water”.

Incidentally the hydrogeology favors Combumune administrative post and in a lesser extent the Ntlavene post as demonstrated in table 5. Both have more than 80 % of their population above the poverty line. In this specific case the selection mechanism based on hydrological determinant even if not transparent or equitable will yield adequate outcomes as far as pro-poor indicators are concerned….If Mabalane-Sede presents better poverty indicator as a whole, the statistics hide very variable situations between the southern villages by the river and the poor and isolated villages of the Plateau which faces some of the worst situation of the district in term of water access. They lie many ten of km away from the river and can only rely on small reservoir that dries at the end of the dry season.

In such context with very high poverty level and deficit of water points the use of complex pro-poor selection mechanisms favoring statistic as proposed by the program can be questioned. The approach proposed seems more adequate to select site within a village than to select villages. There is always of course a risk that pure political considerations will prevail for example allocating water to the poor population of the main urban concentration who are likely to be more vocal than remote rural villages. But in a situation where lack of water access is less a question of income for a few than survival for many, the Consultative Council can be trusted to allocate investments for the best in a transparent and relative equitable manner. At the moment, villages with the best connected and vocal leaders as well as easier access are more likely to have received a second chance than others. Because the district administration responsibility is limited to make sure than the contract are being respected, they have not been incentivized to mobilize a different procedure to select sites. Had less focus be given to the respect of the quantitative indicators and more to the qualitative orientation of

the program (such as involvement of consultative council, participation, pro-poor focus) service administration may have been more inclined to raise the issue of reparation of the remaining equipment at Consultative Council level and involve leaders, civil society along with administration to find a more transparent and equitable allocation of the remaining water points. Indeed this could have had slightly delayed the process but would have improved information on the intervention when lack of information and rumors are generating tension and frustration. The functioning of Consultative Councils is no doubt less participative than intended. Yet they are very new tools and only by giving them the opportunity to participate in this kind of decision making can they be expected to gain force and play they role in full even if it will remain political arena where power struggles will be expressed.

Although they are mentioned in Chicualacuala district (Bakker and al 2010) in none of the village visited an existing pro-poor tariff was identified. It is not clear to what extent villagers were encouraged to discuss this kind of options when new boreholes were being implemented although this is explicitly stated in the program and mentioned by technicians from the 3AS firm. Yet it seems that the objective to comply with the indicator "number of committee created" led 3AS firm to focus on this aspect and minimizing working session where local adaptation of the management model – including tariffs - would be elaborated.

Limited interaction with participatory planning

(to be developed)

Borehole maintenance: a social issue rather than a technical one

PRONASAR put a strong emphasis on the restructuration of the maintenance model: as in many countries in Africa boreholes state are indeed wanted. In the partial[41] census of water sources done by initiated by FAEF in 2012, 12 out of the 36 water points were nonoperational (33 %) and 31 % in the official statistic of the district.

It is now widely admitted that maintenance of water points are directly related to the way community were mobilized during the development phase with focus of early involvement and development of a sense of ownership. It is notably recommended that pump should only be installed after a participatory approach to mobilize the people and create village level maintenance structure. Other important determinant of maintenance success has been found to be the availability of spare, the length of training and content of training which should include both technical aspects and a community mobilization dimension, and to let community choose people to be trained without attempting to create new democratic mode (Batchelor, 2000). This study also acknowledges that complex reparation that is rare second level repair might not be solved at village level. The PRONASAR strategy has obviously taken into account these recommendations.

Most of the boreholes were built in Mabalane in a context of urgency and relief operation (post war/post flood). Various NGOs and structure were involved in the development of these water points namely Auxilio Mundial (World Relief), LWF, CARITAS and PROMUJE and they had their own strategies in term of community mobilization and training so the extent of community initial

[41] The census has not yet been done in the left margin of the river and in some remote plateau village, notably in Combumune administrative post.

mobilization or training remains unclear. Yet in all the villages visited a water committee existed although its power and role varied from one village to the other. Most of them have someone able to do the regular maintenance of the boreholes although the quality of this service can be questioned as this person has apparently not necessarily received a proper training. People that are generally entrusted to do the maintenance of the water point are often young, dynamic and capable – that is why they are selected. This means that they are also more likely than others to migrate and look for better opportunities and in many case, committees mentioned that the people that received the training were not there anymore. In this sense including women in the maintenance staff and providing regular training opportunities could help maintaining a qualified maintenance capacity at village level.

In all water points users are expected to pay a water fee, most of the time a monthly taxes although at some point payment by containers or cattle head exist. The effective rate of payment as recorded in the monitoring book has not been assessed at this stage but the amount of money said to be available at the date of interview is often relatively limited. It is likely that in practice a limited number of families actually pay their water fees. It is also likely that poorest families will choose when possible less expensive option (riverbed) especially if the borehole water is saline. of the money available for repairs would be consequently reduced.

A same village could have one well maintained borehole and a non-operational one and a rapid investigation of maintenance history underlines that reparation are being operated but often on an irregular basis. A borehole may be nonoperational for many months and then repaired. Very isolated communities may have very well maintained boreholes and short break down duration. This indicates that access to spare or capacity is not necessarily the limiting factor to reparation in the area except for very specific case (e.g no more seller in Mozambique of the type of hand pump so no available spare at all). One of the mechanic undertake regular visit in Maputo and is able to bring back spare that cannot be found in Mabalane or Chokwe and it does not necessarily charge an extra amount for the visit. Other interviews confirm that motivated communities are able to find reliable person inside or outside the community to find the spare.

Money thus seems to be more limiting than spare availably. Most of the time, when boreholes are not operational it is because maintenance operation had required a complementary funding collection. In the social context of the communities, such collect can legitimate if organized by the village leaders (2nd scale leader) and not by water committee. It thus depends of the capacity of the leader to mobilize the community. Difficulties of mobilization were repeatedly reported in two cases: (i) the community do not think it is worth paying for repairing the water points because the quality of water is not poor and there are alternative source of reasonable quality at walking distance.) (ii) the management and/or implementation model of the water point created important tension[42] within the community and between the community and the sponsor – up to the point of vandalism sometimes. Although this has not been directly mentioned It is possible that when the leadership is being contested the ability to mobilize the community is weakened. However water being a rare resource in the district it is also possible that communities are able to overcome their difference to contribute to the reparation when it is necessary.

[42] Apart of the case of village C presented in Box 3, two other examples where conflict involving different community groups and the sponsor resulted in a failure to maintain equipment but they have not been properly investigated.

Indeed an organized spare supply chain at district level will help reduce both the price and the length of breakdown. Yet the difficulty of getting access to spare is more a symptom than the cause of failure to repair water points, the cause being the ability of the community to mobilize to collect extra-money for the reparation. What is at stake is the added value of a specific water points to the community and the social and political relationships between the community and their leaderships and/or the development of trust relationship with sponsors that can be mobilized for help.

In some cases the price of the spare or reparation is out of reach of the community[43]. In this case leaders link up with either to administration or external sponsors to find solutions. The difficulty is then the delay between the diagnostic and the repair which can be very long. Following PRONASAR recommendation to find a maintenance model concerning large repairs that is any intervention on the borehole itself[44] (by opposition to repair on the manual pump) or installation of a new pump, SDPI is currently considering officially integrating these reparation within its tasks. The financial model has yet to be clarified.

Collecting quotas at the time of break down does not delay reparation (Batchelor, 2000). He thus suggests letting the community choose their financial mechanisms between regular payment or exceptional quotas. But this goes against the financial models promoted by all government, NGOs and donors actors.

Rather than the way money is being collected and saved, good accounting transparency at village levels can enhance the ability of leaders to mobilize communities. The mechanisms used have not been precisely investigated but many elements points out for deficient or limited transparency at least from Committee/leadership to villagers and from external interventions (administration/NGOs) to villagers. Developing transparency and better communication between the different village authorities implies a medium term support to water committee based on organizational aspects and management.

At last the NGOs and administration have until now made little use of the competencies of local technicians. The PNL technician for example were not aware of the competencies available in the the area. Reinforcing the role of these local mechanics as planned by PRONASAR can can have positive impact. Not only should their technical capacity be enhanced but also their but also their commitment and trust relationships with communities extended. A contractual relationship as planned by PRONASAR is a starting point as far as all actors including villages' leaders are aware of the engagement of all part within the contract. The he organization of regular training of communities' members for routine maintenance operations would also contribute to strengthen the links with communities while maintaining a pool of competence at village level, guaranty quality of basic maintenance operation and strengthen the maintenance network to ensure short delay of reparation at a minimal cost for the administration.

[43] Amount to be properly assessed

[44] Verification of the state of borehole, measuring its depth or water level, cleaning or deepening the borehole, test of handpump

Small collective irrigation system: income for a few or food security instrument

An uncertain impact on food security

The model for collective irrigation follows globally the same pattern in all schemes. The irrigated area is divided in two parts: a collective area which production is being sold to finance fuel for the next cropping season; an individual area in which each member receives a plot he manages (including production destination) as he likes. There is consequently no water fee but the association can request supplementary quota to buy fuel if necessary that is if the amount collected in the collective plot is insufficient which most of the time is the case. The irrigation committee includes a president, a secretary in charge of monitoring expenses and incomes of the association and a production chief in charge of the management of the moto-pump. He is generally the only one authorized to deal with the moto-pump.

In practice irrigation timing depends of the availability of fuel: at association level there are more break due to fuel shortage than breakdowns of the moto-pump, although the latter may generate longer delay in irrigation timing. The functioning costs are all the more important that gasoline is only available in Chokwe - 100 km away on a non-tarred road. This should change in 2013 with the opening of local fuel station. Until now, associations have no option but buy fuel in small quantity at a price 25 to 50 % higher than in Chokwe, or find a transportation option to bring fuel from Chokwe or entrust the money to a transporter.

Interviews underline that after 2 to 5 years of autonomous functioning only a few families (4/8) are still planting crops in a scheme. Others families have desisted over time mainly because they were unable to contribute to the supplementary fuel quota.

It is unclear to what extent the collective area production can support the sustainability of the scheme in short/medium term as well as the individual production: There are very little available data on the economic and technical performance of small irrigation for food security at village or household level either in individual scheme or collective scheme.

An economic survey has been initiated by the Project “support to Park Community”. The first results [45] are summed up in the next tab

TABLE 6 : SOME ECONOMIC RESULT OF SMALL IRRIGATION SCHEME SUPPORTED BY PNL

	Non irrigated Maize	Irrigated Maize	Irrigated bean
Gross margin (MT/ha)	550	2 350	73 310
Work day payment (MT/Ha/jour)	22,4	18,8	505,0
Cash need (MT/ha)	250	4 770	10 550

If irrigated crop are indeed much more profitable than non-irrigated ones, the need for cash for irrigation is also extremely high. In the context of extreme poverty faced by many villagers which are short of food up to 6 months of the year, finding cash to support the functioning of the scheme without considering paying the workforce is a challenge; Interviews indicates that in many situations

[45] Data kindly provided by E Meque supervisor of PNL activities concerning irrigation. Information concerning the number of plots monitored, or the season of irrigation is unfortunately lacking

cash is only available by selling charcoal, an option which is impossible in the buffer zone area. The cash need for an hectare of maize corresponds to the price of a small animal (goat) and the price of a small cattle for irrigated bean. Irrigation is thus only an option for the wealthier families that are able to derive cash on a regular basis. Further investigation of the socio-economics of small irrigated schemes remains necessary to precisely understand the production cost of a scheme over year and thus its potential for food security at village and households level given the local economic opportunities.

The coordination cost of small collective irrigation systems are high and often underestimated in project elaboration. There are all the more important that there have been only rare previous experiences of collective work, and a tradition of top down functioning. Underestimating the difficulties of coordination results in lower yield than expected. This in turn impacts the economic performance of the scheme with higher cost and insufficient production from the collective part to cover for the next cropping. Only long term support and capacity building can help reduce these costs: In most of the case the association only receives a support during the first year of their functioning. As lack of transparency between local elites controlling irrigation management committee is generally the rule rather than the exception the opportunities offered by external support of the scheme is often appropriated by a few well connected families controlling the irrigation committees.

For these families the system indeed provides return in term of food security. But they are also the better off families of the village able to advance regular cash sums for fuel. Can this small irrigation scheme contribute to village food security through job creation? A rapid assessment of small irrigation scheme in the area tends to indicate that: Private small systems of less than 5 ha have no direct impact in local jobs are they are family run enterprise. Only medium scale well-functioning systems (over 8 – 20 ha) contribute to job creation. As families contribution for fuel increase, both the number of families and the cultivated area decrease so an 15/20 ha collective irrigation scale gathering 15 to 20 families will generally leads to a 4/5 ha scheme gathering 4/8 families with no significant jobs input at a village level.

This explains the conflicting perspectives concerning the added value of irrigation at village level that emerged during by focus groups discussion. Some favors small irrigations schemes that will provide direct food security to a few families while other supports implementation of private investment for medium scale scheme that could provide jobs in the village. Preference probably depends on the families' situation in the village and need to be further investigated

Some question concerning the long term sustainability of irrigation scheme

First interviews underline that the performance of the small irrigation systems are mostly related to the following aspects (1) choice of technologies that take into account the main limiting factor at village level which is labor (2) localization of the system and related tenure issues (3) cost of pumping and season

Labor, technologies and pumping costs

As labor is the most limiting factor if these communities with high migration rate and HIV prevalence, there is no real interest in labor intensive system such as manual irrigation if it is not sustained by specific Food-for-Work mechanisms.

Small moto-pumps which requires long irrigation days are also little appreciated. This is all the more important for food security that the family with most limiting labor availability are generally the poorest of the community (for example the elderly, child headed family and widows).

As a food security strategy small irrigation should provide either food and/or wages during the hungry gap season that is the dry hot season starting in September /October until January/February depending on the beginning of the rainy season (and the first crop). Yet this period is also the hottest season with highest level of evapotranspiration and pumping costs are consequently very high, contributing to the exclusion of the poorest of the communities from irrigation schemes. Small irrigation during the rainy or post-rainy seasons is more accessible but this is also when competition for labor is the highest and poor family may find difficulties to face these competition and favor their low cost dry plots rather than irrigated ones.

Localization of the system and tenure issues

Although globally land is not restricted, finding locally an adequate site for irrigation minimizing pumping cost and labor can be challenging: the land closest to the river is also the most fertile area. Permanent access to water in the river is limited to the remaining pools in the river bed and because these areas are the most fertile and interesting areas they have long been occupied and appropriated by powerful members of the communities.

Consequently there are two main ways of securing land suitable for irrigation:

- **Absentee landowner**[46] (for example who has migrated to South Africa and not yet come back to the village after war or migration). Although this case was not formally identified, in some village widows may be in a disadvantageous position to maintain their right on their husband land in the traditional tenure system

- **Negotiation with the landowner**, concerning his integration in the association and his land share depending on his relationship with village leaders and government officials. In some way the collective and common goods have some weigh in the negotiation and if a landowner can in some cases refuse to let his land being used, few cases were identified. In two villages however land conflict had blocked the development of a collective irrigation scheme, all supported by external intervention.

  In one village however the landowner negotiated a larger share of land with the intervention staff supporting the development of the scheme but this was later denied by the association and he withdraw from the association.

Because of this situation, small irrigation is characterized by unstable tenure and cases of moving schemes are not rare. The development of the OIIL funds which allows well connected and informed individuals to acquire irrigation material to develop their own scheme is thus increasing the competition over land suitable for irrigation. Change in village leadership or government district which evolution of the power network between actors offers opportunity for the landowner to claim back his land and develop his own individual irrigation system.

In other case association had to move their land because of a large area of land was allocated to commercial farming by the government. Indeed the land attribution mechanism state than the

[46] Land is property of the State but at local level land right is attributed by local traditional leadership to families of the community and this hereditary land right are respected at community level although they are not legally binding. Only land rights in the form of DUAT are legally binding.

private investor has to compensate the community and negotiation is necessary between the community and the investor for the DUAT process. Compensation is made in the form of investment in the village (building or equipment of school, hospital). In both villages where this compensation had been negotiated, the communities were still waiting for the commitment to be fulfilled a couple of years after the investor had started his operation. These difficulties concerning the relationships between private investors and community are not rare (Tique, 2002).

In this context, the work developed by the NGO LUPA to get a DUAT for collective irrigation schemes may be useful to secure the association's land right but also create internal community conflict if initial landowner rights are not fully acknowledged during in the DUAT process.

The ambiguities of the OIIL funding process

Consultative Councils at the different levels play a real role in the selection of projects. Selection does not take into account the content of the project but only the character of tenderer. This includes member of the Consultative Council that do not comply with the rule of the fund: The project of a member of the district council who had not reimbursed a previous project was discarded.

As in all districts the main issue of the OIIL in Mabalane is the limited reimbursement rate. In 2012, the cumulative payment between 2008 / 2010 corresponding to the first round[47] of project of 6.742.800,00 MT a total amount of 708 148 MT corresponding to 10 % of the sum due only have been paid back. The Consultative Councils have initiated an information campaign to incentivize beneficiaries to reimburse their loan. Commissions were created and are supposed to visit each beneficiary to request repayment. They also are in charge of monitoring the development of the projects and make sure that the money is being used for the intended activities. A couple of beneficiaries who used money for other objectives (for example to buy cars) were summoned by the commission to explain themselves: One is said to have already sold the car and reverted to the initial project.

As reported by Forquilha (2001) and CIP, as in other districts there has been a progressive focus on the rules of attribution of the project realignment of individual project dealing with food production, agriculture or small income creation – by opposition of collective infrastructure for district and village level, limit to project level, increasing the pressure for repayment of the loan.

A second round of payment was made in 2011 and a third one is currently being processed (Table 7, Table 8).

The monitoring of the project underlined an increasing interest for animal breeding projects. This may be due to the increasing pressure to reimburse project: this type of project typically helps to buy females (goat or cattle). As a female is expected to produce a young every year, reimbursement is assessed as easier. This project cannot overcome a limit 75 000 MT corresponding approximately to 5 cattle heads or 20 goats. Agricultural projects mostly related to irrigation project and the amount requested generally covers the moto-pump, the tubes, fuels, seeds and sometimes fertilizers. The maximum limit for agricultural project is 200 000 MT.

[47] To be verified: do the payment rates deals only with the first round of projects or does it include the second round of projects

The total amount received by the district is globally divided in 3 third to avoid any post to be favored. Yet the number of projects submitted is often far below the total amount available for district. This is notably the case of the Ntlavene post, where a majority of villages are within the boundaries of the PNL. Globally competition between projects does not seem very strong. Villagers seem to be reasonably aware of the funds and its potentiality but few of them actually do submit a project. In 2012 all the project submitted came more or less from the same villages. Different explanation are given by the villagers: they do not have the necessary documentation which is too expansive to obtain (their identification card costs 180 MT)[48], they are afraid not to be able to pay back, they are afraid of what might happen to the family if the beneficiary die without having paid back the loan. The request itself can be an impediment although the model is quite simple and a simple letter mentioning the name, the identification number, the nature of the project and the value is sufficient. For most villagers, the request was actually written by the school teacher.

TABLE 7 : OIIL PROJECTS , 2011 ROUND

	Mabalane-Sede	**Ntlavene**	**Combumune**	
Total amount allocated (including 5 % interest) (MT)	2 563 010	2 393 555	(1 880 795) (partial datas)	
Nb of project	28	18	(19)	
Project types				
Agriculture food production	4	9	3	
Animal breeding	11	5	2 (?)	
fishing		1		
Small Industry and carpentery	1			
Agro-processing business	2			
Commerce/small business	8	3	13	
Tourism	1			

TABLE 8 : OIIL PROJECTS , 2012 ROUND

	Mabalane-Sede	**Ntlavene**	**Combumune**	**Total**
Total amount allocated (MT)	1 441 826	1 272 335	1 154 488	3 868 649
Nb of project	12	16	14	42
Project types				
Agriculture food production	2	1		3
Animal breeding	5	12	7	24
fishing	1			
Small Industry and carpentery		1		1
Agroprocessing business				
Commerce/small business	4	2	7	13
Tourism				

[48] This underlines globally the level of poverty of many of these villages.

In the context of high poverty that prevails, the main problem is that the type of project and funding are unlikely to respond to the need of the poorest of the villagers and can only respond to the better off of the communities and local elites. First the poorest people are actually facing food shortage up to 3 to 5 months a year in a normal year. There are few activities that would allow providing both for the lack of food and the surplus necessary to pay back the project. Projects elaborated by the poorest, as related by school teachers involved in the elaboration of their request aim only to compensate for the shortage of food (by asking seeds for example or even directly food). They can only marginally provide surplus to pay back the loan. Although leaders claim not to consider the poverty level of the recipient but only whether he is trustworthy or not, this type of project will probably be negatively assessed. They are no mechanism to account for the important risks faced by the villagers (drought, innovation, death of the main workforce of the family) and even if villagers is considered as serious such project are very risky.

The main critics however is that this funding assume that people are poor because they lack . .. Besides the ideology of this kind of project lies on the hypothesis that poor people are poor because they do not have access to (financial) resources. Social sciences have underlined than on the contrary poverty is not a consequence of the lack of access to (financial) resources but of the lack of social and political capital that would enable them to get access to resources inclusively financial resources. If this program does not capacitate the poor people toward stronger social and political capital, it will only have a minimal impact on the poorest.

Indirect opportunities are also limited by the nature of the projects. As already mentioned only irrigation scheme of more than 8/10 ha actually have potential to provide jobs in a community. Small business opportunity in the poorest village is limited by the extremely limited amount of cash available at village level. Even in the largest village or urban area, market movement seems quite limited. Herding is not a directly paid activities but the herdman generally a teenager keeps one or two young each year in prevision of his marriage (dowry payment to his wife family has traditionally to be made with cattle). Goats are not herd at all and only roam around in the surroundings of the village. Yet in the semi-arid conditions that prevails small animals breeding is probably the most interesting options for the poorest provided it is secured by adequate vaccination and treatment campaign.

Consequently the modification for the allocation of the 20 % natural resources compensation fund payment mode will probably have even less impact on the community than the previous compensation mechanism. Ntlavene post already mentioned difficulty to allocate the full amount of the OIIL to local residents. This results in a larger share to Mabalane-Sede residents, including civil servants and local elites such as business man which already benefit from the fact that the ultimate decision making process is made at district level (District Consultative Council).. Moreover there is now clear rule to make sure that money benefit villagers from the buffer zone which are situated both in Combumune and Ntlavene Post and not only Ntlavene Post. 3 villages of the Ntlavene administrative post are not located in the buffer zone. Consequently the 20 % fund increased to the Ntlavene share will only benefit the civil servants and elites of Mabalane Sede and in no way the local communities.

5. Conclusion

This first characterization of the water issues of Mabalane has permitted to identify structuring elements of water access which are relevant for the geomorphological similar districts of Chicualacuala. Water access at village level combines various factors that can be differentiated in term of technology, cost and water quality and villagers mobilize the different resources according to parameters which remains to be completely clarified. Our hypothesis is that not all water sources have the same appeal to the different range of villagers. In the second phase of this investigation we propose to investigate how livelihoods and poverty levels affect access to water at village level.

The second findings is that in this condition of water scarcity nonoperational points are less a matter of access to spares or maintenance capacity that the ability of village leaders to mobilize the community to collect funds to undertake the reparation. This capacity relates to the added value of water points to the community (water quality) and/or the social functioning of the community. Water is clearly a public good locally and some isolated cash poor communities have developed very efficient strategies to maintain regular supply over time; some of these strategies involves the mobilization of solidarity mechanisms. In other word, good maintenance is much more a political and social management issue than a technical one. Local competencies for maintenance are available and could be better used as planned to be done in the PRONASAR program. If we acknowledge that the issue of maintenance is mainly of social problem, the maintenance initiative of this program can help to minimize reparation costs and breakdown length but not necessarily the rate of nonoperational boreholes.

Although the program has a strong pro-poor and participatory orientation, its implementation restricts district responsibility to the monitoring of implementation that is understood as abiding by quantitative indicators. The attention given to quantitative indicators led to inequitable and opaque procedure to adapt to the project initial failure and delays generating many tensions and frustration. The hydrogeology of the area luckily favors the poorest areas of the district so the pro-poor impact of the project will remains satisfactory. But the program could have more important qualitative impact on the population had it focused more on the qualitative aspects of the strategy than on quantitative indicators. Although support to the decentralization process is one of the state objective of the program, it focuses much more on the Provincial level mechanisms than on the district level ones. This led to undervalue the contribution of district input in the adaptation of the program to local specificities of the district such as the difficult hydrogeomorphology situation. The consequences are were the development of frustrations and tensions as part of the development of the program. ; It will be interesting to follow how the program will react to the adaptation proposal submitted by the district administration to take into account the technical specificities of the district. We need also to better understand the involvement, role and task of the provincial level in the program.

There is little proposition and options to support agricultural income in this semi-arid area apart from small irrigation. Yet in the local context their potential in term of food security or income is probably limited by the high production costs and the coordination difficulties; in particular they have very limited interest for the most vulnerable families which are unable to secure money for the functioning of the scheme. Consequently it is necessary to rethink the (i) irrigation model proposed locally so that expectation either in term of food security or income generation at village and households level can be fulfilled (ii) to propose sustainable livelihoods options for the poorest families and support scheme for these activities. This includes sustainable charcoal and forest

resources exploration combined with protection against over-exploration and small animals breeding with adequate sanitary supports.

As this report was being written the district was hit by a flood wave, nearly as serious as the 2000 floods. We still have little information of its local impact: Unlike downstream cities and settlements villages which are located on higher ground were probably not directly hit but all the crop area located by the river margin which represents half of the cropped area of the district have probably been destroyed. It is likely that irrigation equipment were lost as well as some small water system pumping water in the river affected.

At field level the second phase of our work can thus focus on (i) understanding the choice of the poorest groups in term of water access and food security strategies as well as the strategies used by the families to recover from the flood event (ii) the role of the different institution designing and implementing a recovering strategies at district level (iii) the impact of this kind of event in the social and political functioning of local institutions and the consequences to water access and food security at district and village level.

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ANNEX 1 : FIELD VISIT PROGRAM

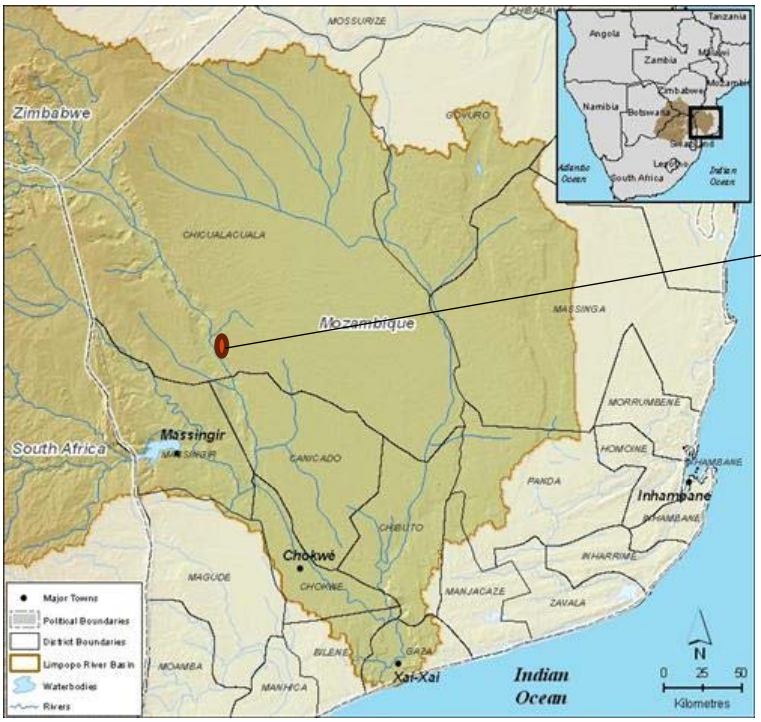
1st stay : 18th to 27th November 2011

Domingo 18/11		Maputo - Chokwe
Segunda 19/11	Chokwe	Encontro P Ernst Auxilio Mundial, Diretor Auxilio Mondial Contact JICA Eau4Food Contact Diretor SDAE Interview D. Rute e Custodia, LWF, tecnicas LWF baseada em Mabalane Interview Claudio Manuel, INAS; coordenar atividades INAS de combate a pobreza extrema Interview Pastor Mbendani, antigo tecnico agua de Auxilio Mundial em Mabalane
Terça 20/11	Mabalane	**Chokwe – Mabalane** Contact ARA Sul ingenheiro Dezenove Contact SDAE Contact Administrador do distrito, secretaria permanente Interview Inacio Cumé , chefe de equipe tecnica (planjemento) e discussao com Pitrosse (repartição) Interview Helena Samba, infirmière
Quarta feira 21/11	Mabalane	Interview Ivo Madeira, LUPA Interview D. Amelia, Sr Raul, Sr Sambe membros do comité consultativo do distrito Interview chef Sdpi
Quinta feira 22/11	Mabalane	Visite du marché hebdomadaire de Mabalane Reunion organisada no ambito do Projeto Pronasar na parte de mobilização social. Lider comunitarios e responsavel decomité, 3AS, DPOH Cacilda Trabalho com Edgar Machava e entretien,tecnico Pronasar SDPI, Mabalane
Sexta Feira 23/11	Combumune Estação	Combumune estaçao interview com chefe de posto Focus group com participantes do conselho consultivo de posto Visite do furos CARITAS e discussão local Visite de furo PRONASAR em funcionamento e discussão com grupo de mulher
	Mobomo	Visita dos 3 furos da aldeia Interview Filipe; locutor ICS (comunicação social, membro do consellho consultivo
Sabado 24/11	Ntlavene	Entrevista chefe de Posto de Ntlavene Visita a Ndope : entrevista Lider 1°, 2° e Terceiro escalão Visita de furo e do rio
Domingo 25/11	Muanzo	Entrevista com a comunidade Entrevista com as mulheres Entrevista com o lider Entrevista com alguns homens Visita ao rio e furos Entrevista diretor escola posto de Ntlavene e supervisor dos professores
Segunda Feira 26/11	Ntalavene et Mabalane	Documentation taken in the Ntlavene post and Mabalane district governement, Discussion with leader and water president of Madlatimbuti Visita da lagoas, furo e poço usado em Matlatimbuti Discussão com o professor da aldeia
Terça Feira	Mabalane Maputo	Entretien mecanico M Mbenzani Recuperação de documentação e atas dos conselhos consultativo no distrito Retour Maputo

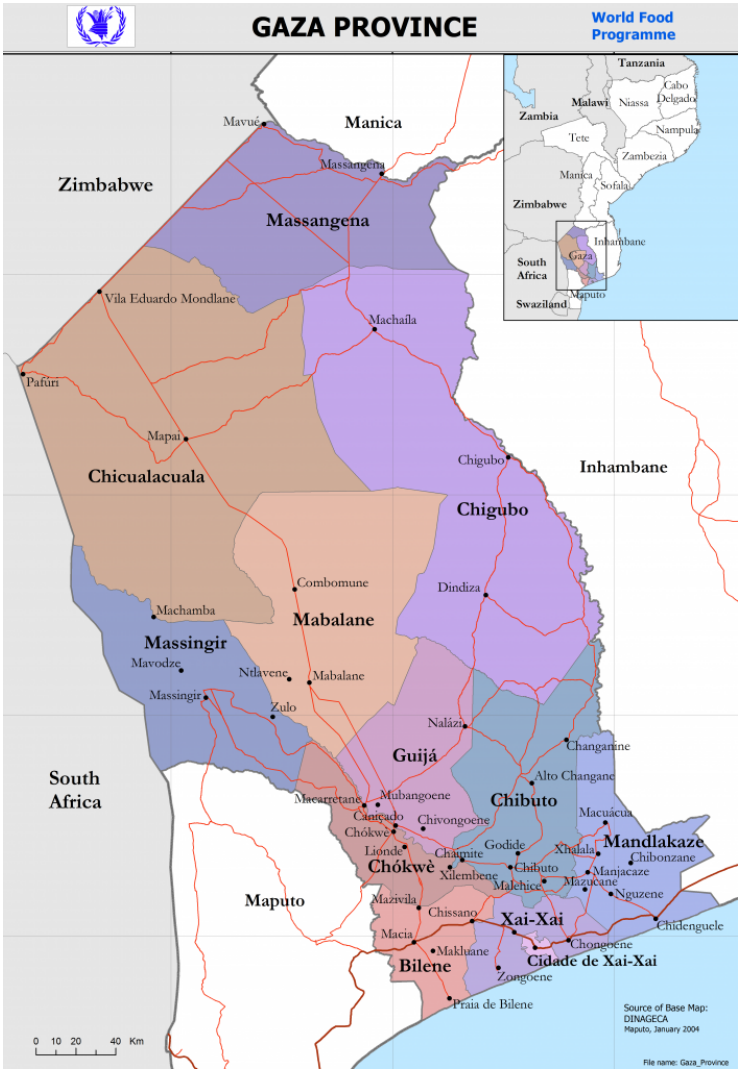
2nd stay

Sexta feira	Tsocate	Travel Maputo – Tsocate Interview Chefe de localidade Tsocaté and lider da localidade e aldeia Visita da represa de de Pfuwke e Tsocate e da confluencia entre Rio Elefantes e Limpopo Visita dos furos
Sabado 8	Jasse	Interview com lider de Jasse (Mr Machava) Interview com Sr Rubem irrigador privado em Jasse
	Nhone	Interview com lider aldeia Nhone e sua esposa Visita do perimetro irrigado de Nhone (INAS) e discussão com presidente
Domingo 8	Nhone	Participação a reunião de Aldeia em Nhone Entrevista com lider 3ero escalão Nhone Discussão com as mulheres da aldeia Discussão com alguns jovens da aldeia Visita da Aldeia de Mavumbuque (Plateau). Discussão com lideres e indunas. Visita dos 3 furos e do esquema de abastecimento de gado Volta para Mabalane
Segunda 9	Mabalane	Visite e discussão coma gricultores de périmètre irrigué privé (1) et collectif (1) na Zona 8 ; Entrevista com os presidente das associaçoe collectivo (perimetro Caritas)
Terça 10		Visita aldeia Chinequete – com lider 2nd escalao e indunas. Entrevista presidente da associaçao irrigaçao Caritas; visita dos perimetro irrigado privado (1) e LWF (1) Trajeto Mabalane Massingir
Quarta 11		Entrevista Antony Alexander, Ricarda Matussi, Louis, Sr Mecque tecnicos do PNL Trajeto Massingir - Maputo

ANNEX 2 : LOCALISATION OF THE DISTRICT OF MABALANE IN THE LIMPOPO BASIN AND GAZA PROVINCE



Mabalane



ANNEX 3 : : LIVELIHOODS IN THE SEMI ARID UPPER PART OF THE DISTRICT

ANNEX 4 : PRONASAR NORMS CONCERNING WATER ACCESS

ANNEX 5 : PHOTOS

Photo 1 : CARITAS borehole and CFM water system in Combumune Estação

Photo 2 : One of the five new PRONASAR boreholes in Combumune-Estação requiring three adults for pumping

Photo 3 : In Mavumbunque pumping is a men business

Photo 4 : Traditional water gathering in the alluvial table of the Limpopo riverbed during dry season

Photo 5 : Traditional transport of water from river to villages

Photo 6 : Cattle watering in the dry riverbed of the Limpopo River

Photo 7 : Traditional well build by villagers (Madlatimbuti)

Photo 8 : Small reservoir used as drinking water source and manual irrigation of garden (Madlatimbuti)

Photo 9 : Reservoir for watering animals

Photo 10 : local system for rainwater harvesting

Photo 11 : system for rainwater harvesting combined with NGO funded cistern (Tsocate)

Photo 12 : rainwater cistern of District gouvernement building in Mabalane

Photo 13 : Gate that used to control the reservoir used by the irrigated system of the jail

Photo 14 : Old cattle watering system of Combumune

Photo 15 : Cattle breeding infrastructure including cattle watering rehabilitated by the government but nonoperational for problem of water yield (Mavumbuque)

Photo 16 : Disused tubes of the old water system of Combumune Estação that brough water from the river (20 km)

Photo 17 : Small water system of Chinequete. The big elevated tanked cannot be used anymore because of the state of the tube.

Photo 18 : View of the “mananga” area (fertile area on the river bank) with fences

Photo 19 : Power pump in one of the remaining water pools of the river bed.

Photo 20 : Irrigation canals

Photo 21 : Canal hand dug to convey water to the power pump.

Photo 22 : Fencing the plot

Photo 23 : Cattle grazing on crop remains

Photo 24 : PRONASAR borehole under development

Photo 25 : PRONASAR borehole under development

Photo 26 : PRONASAR borehole closed because fencing is not finished yet

Photo 27 : Boreholes rules : head must be covered and no unaccompanied children

Photo 28 : PRONASAR borehole in used – Fencing a work in progress